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### **DYKEMAGOSSETTPLLC**

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August 1, 2003

via Overnight Delivery

Eileen L. Furey Associate Regional Counsel U.S. Environmental Protection Agency C-14 J 77 West Jackson Boulevard Chicago, Illinois 60604

Re: ArvinMeritor, Inc.'s Preliminary Responses to U.S. EPA's Request for Information for the Allied Paper/Portage Creek/Kalamazoo River Superfund Site

Dear Ms. Furey:

Pursuant to your letter to Linda Furlough dated May 16, 2003, and the various emails and telephone conversations among us, enclosed are ArvinMeritor Inc.'s preliminary responses to U.S. EPA's Information Requests for the Allied Paper/Portage Creek/Kalamazoo River Superfund Site, a table keyed to proposed findings in the Kalamazoo River litigation, Meritor's proposed findings of fact and conclusions of law, Historical Activities Reconstruction Report, and opinions by Judge Bell and the United States Court of Appeals for the Sixth Circuit in the Kalamazoo River litigation.

Let me briefly outline the background and context of this submission. Following our telephone conversation of June 16, 2003, in which Dave Tripp and I explained the volume of information generated in the Kalamazoo River litigation which might be responsive to U.S. EPA's information requests, you kindly agreed to permit Meritor to submit to you a table summarizing information from the litigation. The goal was to provide you with a summary of meaningful information which might enable you to quickly and efficiently assess potential PCB contamination of the Kalamazoo River from the former Rockwell International Corporation site in Allegan, Michigan.

In preparing the table, it quickly became apparent to us that we needed to supplement the information in the table in order to make it more meaningful. Thus, we also prepared for your review the enclosed "preliminary responses" and their attachments.

You should know that, apart from the litigation materials, Meritor has submitted to U.S. EPA in connection with Meritor's investigation and remediation of its former plant site a significant amount of data that we have neither cited nor included with this letter. In addition, U.S. EPA has a significant amount of data relating to its own and the Michigan Department of Environmental Quality's (MDEQ's) investigation of the former Rockwell plant. For example, on September 6, 2002, Meritor submitted to U.S. EPA its Comments On Proposed Plan Fact Sheet for Removal Action, Volumes I – IX. U.S. EPA also has the Remedial Investigation Report dated July 13, 2001, authored by TetraTech EM Inc. for U.S. EPA in five volumes. Finally, U.S. EPA will be receiving on August 7, Meritor's Removal Action Construction Report.

### DYKEMAGOSSETTPLLC

Eileen L. Furey August 1, 2003 Page 2

As you can tell from their mere description, the foregoing submissions to U.S. EPA are voluminous. Meritor is willing to resubmit to you these documents, in whole or in part, should that be necessary to satisfy any of your further requests. We plan to discuss with you your needs regarding these documents after you have had a chance to review this letter and its enclosures, and after we have had the opportunity to meet with you for further discussion.

Because of the more narrowed and focused nature of this letter and its enclosures, it did not seem practical or efficient to resubmit these other materials to you now. Rather, we restricted the present responses to those materials generated for and in the course of the litigation on behalf of Meritor because they provide, in our view, the best, summary overview. As you may know, after years of discovery, trials and appeals, both Judge Bell and the United States District Court for the Sixth Circuit declared that Meritor should not share in the allocation of any response costs for the clean-up of PCB contamination in the Kalamazoo River.

As mentioned above, after you have had an opportunity to review the enclosed, we welcome a meeting with you to further discuss our responses and any other additional material you might need.

Very truly yours,

DYKEMA GOSSETT PLLC

Joseph C. Basta

cc: Renita Ford, U.S. Department of Justice (w. enclosures)

Robert Schroder Linda Furlough

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## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 5

Request for Information Pursuant to Section 104(e) of CERCLA For Allied Paper/Portage Creek/Kalamazoo River Superfund Site in Kalamazoo and Allegan Counties, Michigan

# PRELIMINARY RESPONSES OF ARVINMERITOR INC. TO U.S. EPA INFORMATION REQUESTS ALLIED PAPER/PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

ArvinMeritor, Inc. ("Meritor"), by its counsel, provides its Preliminary Responses to the Section 104(e) Information Request of the Environmental Protection Agency, as modified by correspondence between Meritor's counsel and U.S. EPA's counsel, to permit a response using the materials provided by Meritor to the Court in recent litigation concerning PCB contamination of the Kalamazoo River. Meritor provides this Preliminary Response, table and attachments, copies of proposed Findings of Facts and Conclusions of Law submitted by Meritor to the Court, and the Court's opinions.

#### **REQUESTS**

<u>Request 1</u>. Identify all persons consulted in the preparation of your responses to these Information Requests.

**Response:** Linda Furlough, ArvinMeritor, Inc.; Martha Fleming, Environmental Strategies Corporation; Robert Barrick, Entrix, Inc.; Gregory Carli, Conestoga-Rovers & Associates, Inc.

Request 2. Identify all documents consulted, examined, or referred to in the preparation of your responses to these Information Requests, and provide copies of all such documents. If, in lieu of or along with a textual response to any specific Request, you refer to a document that you believe contains information responsive to that Request, you must identify the specific location (page number, paragraph number) in the document where responsive information can be located.

**Response:** By agreement with the U.S. EPA, Meritor has prepared these Preliminary Responses by reviewing the proposed Findings of Facts and Conclusions of Law submitted by Meritor to the United States District Court for

the Western District of Michigan in connection with the bench trials of *Kalamazoo River Study Group v. Rockwell, et al.,* Case No. 1:95-CV-838, assigned to the Honorable Robert Holmes Bell. The tables provided with these Preliminary Responses correlate particular proposed Findings and Conclusions to the various requests from U.S. EPA; the proposed Findings and Conclusions are provided to U.S. EPA here as well. The proposed Findings and Conclusions offer the best means of reviewing the evidence in Meritor's possession concerning alleged PCB contamination by Meritor of the Kalamazoo River, and they provide a ready entry into tens of thousands of pages of deposition testimony, trial exhibits, and trial testimony.

**Request 3.** If you have reason to believe that there may be any person able to provide a more detailed or complete response to any Information Request, or who may be able to provide additional responsive documents, identify any and all such persons.

**Response:** Not applicable given the starting point of the proposed Findings and Conclusions. There were dozens of persons whose depositions were taken and whose names were listed on the witness lists for the *KRSG v Rockwell* litigation. Those depositions and witness lists can be provided to U.S. EPA if requested.

#### **Request 4.** Identify:

- (a) the address of the facility;
- (b) past and present U.S. EPA ID numbers, RCRA numbers, and NPDES numbers for the facility; and
- (c) the current owner of the facility.

#### Response:

- (a) The address of the facility is 1 Glass Street, Allegan, Michigan 49010.
- (b) The U.S. EPA ID No. for the facility is MID006028062. NPDES Permit No. MI0003867 was issued on April 29, 1974 for three permitted outfalls (Outfall No. 001, 002, & 003).
- (c) The present record owner is the City of Allegan; however, there is current litigation over title to the property which Meritor expects will vest title in Meritor.

<u>Request 5.</u> Identify all prior owners and operators of the facility, and their dates of ownership and/or operation.

**Response:** See Response to Request 22, tables provided with these Preliminary Responses; and Historical Activities Reconstruction Report, pp. 3-32.

**Request 6.** Provide copies of all local, state, and federal environmental permits ever granted for the facility or any part thereof (e.g., RCRA permits, NPDES permits, etc.).

**Response:** Any permits Meritor may have would be in off-site archives that it can make available to U.S. EPA upon request.

**Request 7.** Identify and describe all types of monitoring reports, monitoring data, and documentation sent to or received by federal or state regulatory authorities regarding any materials containing hazardous substances used, generated, stored, treated or disposed at or from the facility.

**Response:** See cover letter accompanying these responses for a description of additional available data, tables provided with these preliminary responses, and Historical Activities Reconstruction Report, pp. 37-40. Meritor has limited Discharge Monitoring Reports in off-site archives that it can make available to U.S. EPA upon request.

**Request 8.** Identify and describe the nature of all past and current operations and production processes at the facility. Identify, if available, all current and previous SIC codes associated with the facility.

**Response:** See tables provided with these Preliminary Responses and Historical Activities Reconstruction Report, pp. 33-35.

<u>Request 9</u>. Identify each product produced at the facility. Further identify the mass quantity of each product produced on an annual basis.

**Response:** See tables provided with these Preliminary Responses and Historical Activities Reconstruction Report, pp. 33-35.

**Request 10.** Identify and describe any and all activities or efforts to take production facilities out of operation, and include the dates of each such activity or effort.

**Response:** See tables provided with these Preliminary Responses and Historical Activities Reconstruction Report, pp. 26-31.

**Request 11.** Identify and provide any data, estimates, analyses or other information regarding any material used in the production processes at the facility that contained or may have contained PCBs. To the extent available, provide all such data, estimates, analyses or other information on an annual basis.

**Response:** See Response to Request #7.

Request 12. Identify any data, estimates, analyses or other information regarding the concentration of PCBs in any material used in the production processes at the facility. To the extent available, provide all such data, estimates, analyses or other information on an annual basis.

**Response:** See Response to Request #7 and Historical Activities Reconstruction Report, pp. 37-40.

**Request 13.** To the extent not already provided in response to Request #11, provide the following information:

- (a) the type and quantity, on an annual basis, of any oils or other lubricants used at the facility that are known or suspected to have contained PCBs;
- (b) the number, handling and disposition of all transformers and conductors at the facility; and
- (c) data, analysis and other information regarding leaks, discharges or other releases from any transformer, conductor or other equipment using oils or lubricants at the facility.

**Response:** See Response to Request #7; tables provided with these Preliminary Responses; and Historical Activities Reconstruction Report.

**Request 14.** To the extent not already provided in response to Request #12, identify any data, estimates, analyses or other information regarding the concentration of PCBs in the materials identified in your response to Request #13.

**Response:** See tables provided with these Preliminary Responses.

Request 15. Describe the procedures used by you or anyone on your behalf to test PCB concentrations in the materials identified in your response to Requests #11 and #13, above. Include in your response test methods and dates.

**Response:** See tables provided with these Preliminary Responses.

**Request 16.** Describe the procedures followed by you, or anyone on your behalf, to prevent, mitigate or address the release or threat of release of any material identified in your response to Requests #11 and #13, above.

**Response:** See tables provided with these Preliminary Responses.

**Request 17.** Provide a figure delineating the groundwater flow direction on your property.

**Response:** See Attachment A. This is a copy of Figure 10 – Potentiometric Surface Map, October 2000 from the "Revised Remedial Investigation Report, Rockwell International Corporation Site, Allegan, Michigan", Tetra Tech EM, Inc. July 13, 2001, which shows the groundwater flow direction in the vicinity of the facility.

**Request 18.** Identify the depth(s) to groundwater at your property.

**Response:** See Attachment B. This is a table (Table 1) which summarizes groundwater level measurements collected by Tetra Tech EM, Inc. on behalf of U.S. EPA, by Earth Tech, Inc. on behalf of the Michigan Department of Environmental Quality (MDEQ), and by Conestoga-Rovers & Associates on behalf of Meritor between October 2000 and present.

**Request 19.** Identify the type and amount of all raw process water sources used in the production processes at the facility. To the extent available, provide such information by month of operation.

**Response:** To its knowledge, Meritor obtained water from three production wells on the facility but has no further information.

**Request 20.** Identify and describe all information about the PCB content of the raw process water used in each production process at the facility. To the extent available, provide such information by month of operation.

**Response:** Meritor is unaware of any information suggesting that any raw process water contained PCBs.

**Request 21.** Identify and describe what type of treatment, if any, was used to treat raw process water prior to its use in each production process at the facility.

**Response:** Meritor is unaware of any information concerning treatment of raw process water.

**Request 22.** For each production process at the facility, identify and describe each waste stream from its creation to final disposition.

**Response:** The Allegan Mirror and Plate Glass Company owned the facility from 1901 to 1914, manufacturing glass products since at least 1908 when the first building was constructed. The waste stream for that production is unknown.

Blood Brothers Machine Company purchased the facility in 1914 and began manufacturing universal joints and automobiles in 1915. Following several mergers, Rockwell International Corporation became the facility owner in 1953 and manufactured drive line parts and universal joints for large vehicles and construction equipment until approximately 1988. Decommissioning activities occurred between 1987 and 1992, when the facility's wastewater treatment plant ceased handling stormwater and was closed. A portion of the facility was used by Allegan Industrial Redevelopment Corporation from 1992 to 1996, when all operations ceased.

The facility manufacturing involved the following processes and waste streams:

 Machining of steel by turning, milling, grinding, drilling, cutoff and friction welding, and balancing. In addition to work areas, components of the machining facility included process bins, a nylon coater, chip oil recovery system, and a chip-loading facility. Cutting and lubricating oils were used in this process and were subsequently removed from machined parts using a detergent-water washing process. Used oil was either recovered, recycled and sold, or treated as oily wastewater. In addition to lubricants, machining processes used emulsifiers, oxidation inhibitors, cleaning compounds, treatment compounds, metal filings (including grinding swarf), and metal salts. Swarf was composed of an oily sludge containing lubricants, carborundum, and ground metallic dust.

Meritor is not aware of any documentation of waste handling prior to the 1930s. From the 1930s to 1945, oil, metal particles, dirt, and cooling water in the manufacturing area were collected in floor drains and then conveyed to storm drains that discharged to the Kalamazoo River or its backwaters.

In 1945, an oil/water separator facility was constructed within the former Oil Flotation House and used through approximately 1970-1972 to separate oils from wastewater prior to entry to storm drains discharging to the Kalamazoo River.

In the 1960s, the facility began substituting water-soluble oils for straight cutting oils, which reduced the volume of oils through the former Oil Flotation House. To improve the efficiency of soluble oil removal, a former Soluble Oil Settling (SOS) Pond was constructed in 1964 to receive those wastes. Rancid, soluble machining oil was collected directly from the equipment into small "pump carts" that were wheeled out to the former SOS pond and drained.

The former SOS pond was closed in 1966 and 1967 by placing fill in the pond from west to east, with concurrent excavation and progressive "pushing" of the pond east to an "Interim Pond". These ponds served the same purpose and operated in the same manner throughout the 1960s.

In 1970, a new drain system (process sewer) was constructed to convey all process wastewater (containing both non-soluble and soluble oils) to holding tanks and then to an onsite wastewater treatment plant. The treatment plant discharged to a three-pond system, and ultimately to the Kalamazoo River through a NPDES-permitted outfall. The Interim Pond was closed in 1970 and the contents were transferred to Wastewater Treatment Pond No. 1.

- Heat-treating, or annealing, was performed using either a radiant heat furnace followed by quenching in oil, or induction heating followed by a water spray. Spent quench oils were disposed of offsite by a hauler. Case-hardening using cyanide-salt baths were used possibly prior to 1938 until 1947, however, Meritor is not aware of any information on potential waste streams. Initially, contact and non-contact cooling waters, overflow of reclaim water used in the heat treat furnaces, and water from the heat treat washers discharged to a stormdrain to the Kalamazoo River. Contact-cooling water from a new Heat Treat facility constructed in 1972 was discharged to one of the wastewater treatment ponds.
- Assembly of manufactured parts generated no chemical waste streams.
- Some electrical transformers used at the facility contained PCBs but there
  is no record of releases, except as described in the response to Request

23. One substation constructed circa 1946 was decommissioned circa 1955. A second substation inside the facility was dismantled and replaced by a new substation circa 1969 that was used until operations ceased.

Additional information is provided in the Historical Activities Reconstruction Report.

**Request 23.** Identify any data, estimates, analyses or other information about the presence of PCBs in each waste stream created at the facility. To the extent available, provide such information on an annual basis.

**Response:** Some transformers used at the facility contained PCBs but there are no documented releases. One temporary outdoor transformer used during construction circa 1969 was reportedly struck by lightning, rupturing the unit and causing spillage of the dielectric fluid. No chemical tests were conducted of the spilled material.

None of the manufacturing processes required or used PCBs, nor are there any PCB measurements for any waste stream during the operation of the facility.

Incidental contamination of some purchased oil products is possible, based on the presence of trace (parts-per-million) levels of PCBs in samples of light non-aqueous phase liquids (LNAPL) collected from some groundwater wells at the facility.

There is only a single measurement of the discharge volume from Outfall No. 001, and no PCB measurements. The Michigan Water Resources Commission (MWRC) estimated a discharge of 270 gallons of oil from Outfall No. 001 in a twenty-four hour period from March 9 to March 10, 1965. Following pumping of the oil storage and separation tanks on March 10, 1965, the MWRC estimated an oil discharge of approximately 5.1 gallons per day.

PCBs were undetected at a detection limit of 0.001 mg/L in a single grab sample of treated wastewater effluent collected from Outfall No. 002 on June 29, 1984.

**Request 24.** Identify any data, estimates, analyses or other information about the concentration of PCBs in each waste stream created at the facility. To the extent available, provide such information on an annual basis.

**Response:** See Response to Request 23.

**Request 25.** Describe the procedures used by you, your predecessor(s), or anyone on behalf of you or a predecessor, to test the PCB concentration in each waste produced at, or at each waste handling process of, the facility, Include in your response test methods, media tested, and dates.

**Response:** No PCB testing of wastes was conducted during the operation of the facility except for a single PCB analysis of an effluent grab sample collected from Outfall No. 002 on June 29, 1984. PCBs were undetected at a detection limit of 0.001 mg/L.

During the 1970s and 1980s, Rockwell did not purchase oils known to contain PCBs based on periodic surveys of the facility's oil vendors in accordance with Rockwell corporate policies. Written documentation of these surveys, performed for the Allegan facility, does not exist.

Since 1989, PCB analyses have been conducted on samples of various environmental media, including soil, sediment, groundwater, and LNAPL, using standard U.S. EPA methods described in the quality assurance project plans and appendices for the various remedial investigations.

Request 26. Identify each off-site location at which wastes from the facility that contained or potentially contained PCBs were disposed. Further identify the dates of each such offsite disposal, and the nature, quantity and PCB concentration of any such wastes.

Response: See tables provided with these Preliminary Responses.

Request 27. Identify and describe in detail the area(s) used by you or any predecessor for the storage, treatment or disposal of any waste generated at the facility. Include in the description of each area information concerning the nature and volume of the waste(s) stored, treated or disposed there. To the extent available, provide such information on an annual basis.

**Response:** See tables provided with these Preliminary Responses.

Request 28. For each area identified in response to Request #27:

(a) identify the PCB concentration of any wastes stored, treated or disposed there. To the extent available, provide such information by month of operation; and

(b) describe the procedures and measures taken by you, or anyone on your behalf, to prevent, mitigate or address the release or threat of release of PCBs or other hazardous materials.

**Response:** See tables provided with these Preliminary Responses.

**Request 29.** If any area identified in your response to Request #27 is no longer used by you to store, treat or dispose of wastes, describe in detail the current condition of the area. Further describe and provide data, estimates, analyses or other information regarding:

- (a) measures taken by you, or anyone on your behalf, to treat or dispose of any wastes previously stored, treated and disposed in each such area:
- (b) any residual wastes remaining in each such area;
- (c) measures taken by you, or anyone on your behalf, to prevent, mitigate or address the, release or threat of release of the wastes previously stored, treated or disposed of in each area.

**Response:** See tables provided with these Preliminary Responses.

**Request 30.** Provide a figure drawn approximately to scale depicting any area of the facility used by you or a predecessor to store, treat or dispose of any waste generated at the facility. Include the location of the Kalamazoo River in your figure.

**Response:** See Attachment C, Figure 2.2 of the Remedial Design Work Plan, Former Rockwell International Site, Allegan, Michigan, Revision 2 dated July 9, 2003 prepared by Conestoga-Rovers & Associates on behalf of Meritor. Figure 2.2 of the RD Work Plan is a Site Plan of the facility and shows the location of the Former Soluble Oil Separation Pond, the Former Interim Pond, the Waste Water Treatment Plan and Ponds, and the Former Oil Flotation House.

Request 31. For each area identified in response to Request # 27, identify any data, estimates, analyses or other information regarding the nature and quantity of hazardous substances, including PCB's, released or threatened to be released from each such area. To the greatest extent possible, provide such information on an annual basis.

**Response:** See tables provided with these Preliminary Responses.

Request 32. For each area of the facility identified in response to Request #27, identify any data, estimates, analyses or other information regarding the release, or threat of release, of hazardous substances, including PCBs, to the Kalamazoo River or any other area of the Site. To the greatest extent possible, provide such information on an annual basis.

**Response:** See tables provided with these Preliminary Responses.

Request 33. Identify any data, estimates, analyses or other information about the history of flooding from the Kalamazoo River at the facility. Further, identify any data, estimates, analyses or other information about any infiltration of water, or threat of infiltration of water, from the Kalamazoo River into the areas identified in your response to Request #27.

**Response:** Meritor is unaware of any information on flooding at the facility. The stage gauge readings for the Allegan station cover only a brief period of time and there is no stage gauge reading for the Kalamazoo River proximate to the facility. Historic high-water events for the site must be inferred from the Comstock and Fennville gauging stations, located well upstream and downstream from the three wastewater treatment ponds.

The present site of the three wastewater treatment ponds, however, was originally part of the Kalamazoo River and was inundated in part or completely until 1969. The largest Kalamazoo River flood of record occurred in 1947, prior to the 1970 construction of the perimeter dike forming the wastewater treatment ponds. The second largest flood event on the Kalamazoo River near the site occurred in 1978 (9,030 cfs.) and was approximately one half the size of the 1947 flood event (17,500 cfs.). The 1978 flood would have likely produced a water surface elevation substantially lower than the of the 1947 flood event. All flood events subsequent to 1947 on the Kalamazoo River were substantially smaller.

The water surface elevation of the 100-year occurrence flood is estimated by the Federal Emergency Management Agency to be 619.5 feet (National Geodetic Vertical Datum of 1929) in elevation while the estimated surface elevations at boreholes locations on the perimeter dike are all over 620 feet. There is no evidence on aerial photographs that the perimeter dikes were affected by high water conditions in the Kalamazoo River.

**Request 34.** To the extent not provided in your response to Request #22, describe each wastewater stream, waste oil stream, and wastewater/waste oil mixture stream at

the facility, from its creation in the production process to final discharge point. In your response include a complete description of the fate of any wastewater stream, waste oil stream, and wastewater/waste oil mixture stream produced at the facility (e.g. on-site treatment, discharge to a POTW, discharge to a storm sewer outfall, direct discharge to the Kalamazoo River).

Response: See Response to Request #22.

Request 35. To the extent not provided in response to Requests #22 and #34, identify the amount of all (a) wastewater, (b) waste oil, and (c) wastewater/waste oil mixture produced, on a monthly basis, from each production process at the facility.

**Response:** See Responses to Requests #22 and #34.

Request 36. To the extent not provided in response to Requests #23 and #24, identify any data, estimates, analyses or other information about the presence and/or concentration of PCBs in the wastewater, waste oil and wastewater/waste oil mixture produced from each production process at the facility. To the extent available, provide such information on a monthly basis.

Response: See Responses to Requests #23 and #24.

Request 37. Identify any data, estimates, analyses or other information regarding the effectiveness of the treatment system(s) at the facility, if any, to remove PCBs from each wastewater stream, waste oil stream and wastewater/waste oil mixture stream at the facility.

**Response:** See cover letter to these preliminary responses and Response to Request #7. PCBs in trace amounts appear to have been an unintended contaminant in some oils used at the facility. Meritor was unaware of their presence when treatment systems were employed, and thus has no information on effectiveness.

Request 38. Identify any data estimates, analyses or other information regarding procedures and measures taken by you, or by anyone on your behalf, to prevent, mitigate or address the release or threat of release of PCBs from wastewater, waste oils, or wastewater/waste oil mixtures to the Kalamazoo River.

Response: See Response to Request #37.

Request 39. For any POTW identified in response to Request #34, provide on a monthly basis, all information regarding the amount of wastewater, waste oil, and waste, water/waste oil mixture discharged to a POTW, the concentration of PCBs in the wastewater, waste oil and wastewater/waste oil mixtures discharged to the POTW from the facility and, to the extent such information is available, the PCB concentration in the effluent from the POTW.

**Response:** To Meritor's knowledge, only sanitary wastes discharged to the POTW, and these were not measured.

Request 40. Identify each pipe, conduit, storm sewer, sewer line or other outfall that, directly or indirectly, terminates in the Kalamazoo River or its tributaries, past or present, into which treated, untreated or bypassed wastewater, waste oil, or any other waste (including wastewater/waste oil mixtures), from the facility was discharged. Include a figure identifying the source and location of each pipe, conduit, storm sewer, sewer line or other outfall.

Response: See Attachment D. This shows the location of the two former Outfalls (Outfall No. 001 and Outfall No. 002) located on the north portion of the facility. Drawing No. 1 also shows the location of a storm water outfall from the adjacent Allegan Metal Finishing property which was originally part of the facility. Drawing No. 2 shows the configuration of utility lines located south of North Street prior to implementation of the Removal Action which was conducted in this area pursuant to the Unilateral Administrative Order (UAO) issued to Meritor by U.S. EPA.

Request 41. For each pipe, conduit, storm sewer, sewer line or other outfall identified in your response to Request #40, identify dates of use and each outfall's source at the facility. Further provide, on a monthly basis, the volume of wastewater, waste oil or other waste (including wastewater/waste oil mixtures) discharged from the facility into each pipe, conduit, storm sewer, sewer line or other outfall.

**Response:** Outfall No. 001 is located to the north of the facility and was used to discharge non-contact cooling water and storm water from roof drains and other sources to the Kalamazoo River. The dates of operation of Outfall No. 001 are unknown. The outfall currently exists and is monitored by Meritor under the Removal Action UAO on a monthly basis for discharge.

Outfall No. 002 discharged to the Kalamazoo River via Pond No. 3. The WWTP and associated ponds were constructed in 1972 and it is assumed that discharge via Outfall No. 002 were initiated shortly thereafter. The outfall is still present, however, no discharges have been observed since Meritor began monthly monitoring of this outfall in October 2001.

Outfall No. 003 discharged to the Kalamazoo River south of the facility and contained boiler blowdown water, storm water and treated wastewater from the former Oil Flotation House. This outfall was installed in the 1940's and was removed during the UAO Removal Action. It was replaced with a new outfall that discharges storm water from North Street, the County of Allegan Health Services Building, and the parking lot located at 249 North Street.

**Request 42.** For each pipe, conduit, storm sewer, sewer line or other outfall identified in response to Request #40, identify all influent and effluent quality data. Include, to the extent such information is available, the PCB concentration of all influent and effluent, on a monthly basis.

**Response:** Meritor is unaware of any influent or effluent quality data for Outfalls Nos. 001, 002, or 003, other than the limited Discharge Monitoring Reports held in offsite archives and described in the response to Request 7. The only PCB concentration data are from a single analysis of an effluent grab sample collected from Outfall No. 002 on June 29, 1984. PCBs were undetected in that sample at a detection limit of 0.001 mg/L.

<u>Request 43.</u> For each pipe, conduit, storm sewer, sewer line or other outfall identified in response to Request #40, identify all bypasses or spills into the Kalamazoo River or its tributaries.

**Response:** No additional information regarding the outfalls is available beyond what is presented in the responses to Information Request Nos. 40 through 42.

Request 44. Identify any data, estimates, analyses or other information regarding the mass quantity of PCBs disposed into the Kalamazoo River as a result of wastewater, waste oil or wastewater/waste oil discharges from the production processes at the facility. To the extent available, provide such information on an annual basis.

**Response:** See Response to Request #23.

**Request 45.** Identify any data, analyses or other information regarding the nature and quantity of hazardous substances, including PCBs, in the sediments, soil, groundwater and surface water at the facility. Identify the concentration levels of PCBs for all samples collected at the facility or at any property abutting the facility.

**Response:** See data and reports cited in cover letter.

Request 46. Provide information regarding any environmental response activities involving or potentially involving PCBs or PCB-containing materials conducted at the facility, or on the Kalamazoo River, its tributaries, or other abutting property, at your direction or under your control. Indicate the date(s) on which such response activity was performed, what work was performed, the expenses incurred, the results of the response activity and, if it has not concluded, when the environmental response is expected to conclude.

**Response:** In August 2001, Meritor was issued a UAO to implement a Removal Action in the vicinity of 267 North Street, from the facility to the Kalamazoo River. Removal action activities were conducted during the period of October 2001 to February 2002 with subsequent Site activities being conducted during the period of May 2002 to February 2003. Final restoration activities were completed in June 2003.

Activities that were conducted in order to complete the Removal Action included the following:

- Delineation and excavation of PCB impacted soil in the vicinity of 267
   North Street and the County of Allegan Health Services building;
- Verification sampling of excavations;
- Replacement of a storm sewer line and outfall to Kalamazoo River;
- Replacement of a sanitary sewer line;
- Removal of a former storm sewer line and the foundation of the former Oil Flotation House located North of North Street;
- Backfilling and grading of excavated areas with appropriate imported fill material;
- Transportation of excavated soil to disposal facilities; and
- Restoration activities.

A complete summary of the UAO Removal Action activities will be provided in the Removal Action Construction Report, including an estimate of the costs to implement the removal action, which is scheduled to be submitted to U.S. EPA on August 7, 2003.

Request 47. Identify all persons who you believe may have knowledge or information about the generation, transportation, treatment, disposal, release or other handling of waste materials, including hazardous substances, at the facility.

Response: See Responses to Requests #1 and #3.

Request 48. Have you incurred any costs associated with the investigation, remediation or other action to address contamination at the Site or any portion thereof? If yes, identify all costs incurred by you through the date of this Information Request.

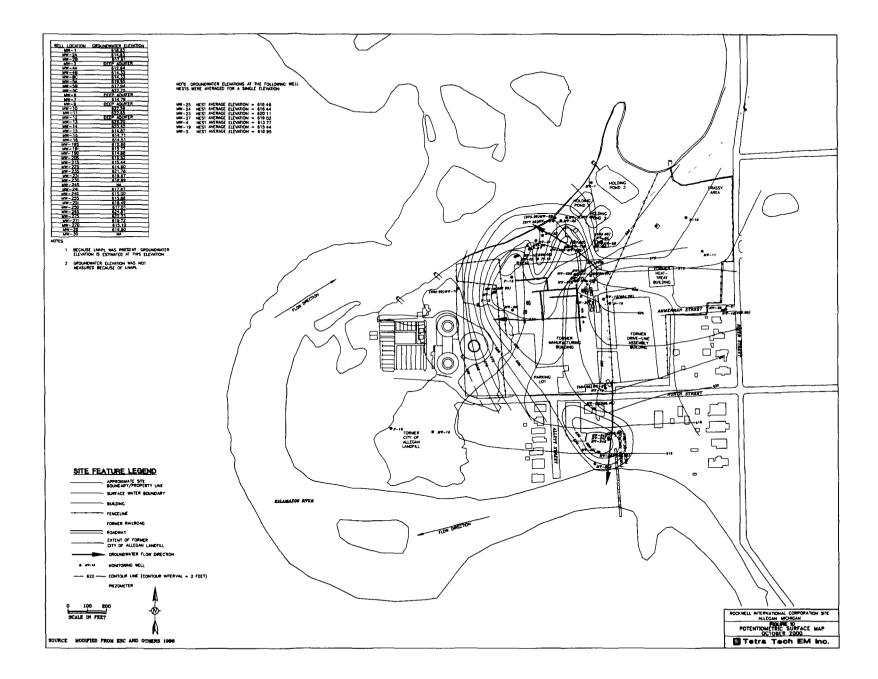
**Response:** Meritor has incurred costs for sampling and investigation of the Kalamazoo River in 1995 and 1996 near the facility because of the litigation.

**Request 49.** Identify any data, estimates, analyses or other information regarding the relative contributions of PCBs to Lake Allegan by "facilities," as that term is defined in CERCLA.

**Response:** See tables provided with these Preliminary Responses.

August 1, 2003

AA01\107099.2 ID\JCB



7. TED

## MONITORING WELL CHARACTERISTICS AND WATER LEVEL DATA FORMER ROCKWELL INTERNATIONAL CORPORATION ALLEGAN, MICHIGAN

		тос	Ground	Well	Depth to	Depth to	Top of	Bottom of												
	Installation	Elevation	Elevation	Depth	TOS	BOS	Screen	Screen			Depth to V	Nater (feet)				1	Depth to Ll	VAPL (feet	•)	
Location	Date	(ft AMSL)	(ft AMSL)	(feet)	(feet)	(feet)	(ft AMSL)	(ft AMSL)	10/1/2000	5/11/2001	11/6/2001	5/15/2002	8/12/2002	6/10/2003	10/1/2000	5/11/2001	11/6/2001	5/15/2002	8/12/2002	
MW-1	2/8/1990	624 26	621 74	160	46	14 6	6197	609 7	5 63	9 21	8 80	9 23	10 38	9 30	_		8 45	8 39	9 18	9 20
MW-2A	1992/1993	632 02	628 89	20 0	80	18 0	624 0	614 0	17 09	11 85	11 00	10 89	14 06	12 00		-	-			
MW-2B	10/6/2000	630 39	627 49	27 0	22 0	27 0	608 4	603 4	12 78	16 33	15 58	15 52	16 26	16 36		-	-			-
MW-2C	2/21/1990	n/a	NS	200	n/a	18 0	n/a	n/a	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
MW-3	3/19/1990	630 39	627 49	1170	93 1	98 1	537 3	5323	NM	14 31	13 90	13 61	14 48	14 45	NM		-	-		-
MW-4A	2/13/1990	630 71	631 27	230	11 1	21 1	619 6	609 6	18 07	16 05	15 32	15 40	20 10	16 60	16 57		14 50	14 65	15 39	15 45
MW-4B	2/12/1990	630 73	631 37	27 5	24 0	27 2	606 7	603 5	16 <b>4</b> 0	15 58	14 87	14 80	15 59	15 72	-		14 86	-		-
MW-4C	2/12/1990	630 97	631 45	35 0	30 4	33 0	600 6	598 0	16 64	15 79	15 08	15 03	15 <b>7</b> 5	15 95			15 05	-		
MW-5A	10/6/2000	634 93	632 08	20 0	125	195	622 4	615 4	14 98	14 36	13 72	13 66	16 03	14 61	-	-			-	
MW-5B	10/6/2000	635 02	632 19	44 0	25 0	30 0	610 0	605 0	17 08	16 28	15 78	15 39	16 92	16 24	-	-	-	-		
MW-5C	2/26/1990	634 72	632 06	70 0	57 3	673	577 4	567 4	11 88	11 06	10 96	9 29	10 59	10 31	-	-		-		
MW-6	3/19/1990	624 42	621 49	<b>7</b> 6 0	68 0	73 0	556 4	551 4	NM	7 77	7 14	7 03	8 22	8 15	NM	-		-		-
MW-7	2/10/1990	624 62	621 67	160	34	134	621 2	611 2	9 83	9 43	8 60	8 25	9 49	9 61		-	-		-	-
MW-8	2/9/1990	622 09	620 34	20 0	48	148	6173	607 3	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
MW-9	2/6/1990	627 53	628 05	161 0	92 5	97 5	535 0	530 0	NM	10 11	NM	9 17	11 73	10 55	NM	-	NM	-	-	
MW-10	1992/1993	628 98	629 46	66 0	40	140	625 0	615 0	6 39	6 92	5 41	NM	NM	NM	6 22	-	4 84	NM	NM	NM
MW-11	2/6/1990	630 82	628 76	160	76	150	623 2	615 8	8 17	NM	NM	5 46	8 48	7 12		NM	NM		-	-
MW-12	11/11/1992	631 49	631 90	86 0	65 0	85 0	566 5	546 5	NM	59 81	7 67	6 76	7 7 <b>1</b>	7 36	NM	-			-	
MW-13	11/13/1992	631 11	631 70	490	70	170	624 1	614 1	4 91	5 20	NM	3 75	6 89	NM		-	NM			NM
MW-14	1992/1993	628 33	629 40	<b>4</b> 6 0	75	175	6208	6108	7 91	8 95	NM	7 20	9 13	8 14	_		NM	-		
MW-15	11/17/1992	620 87	618 30	120	20	120	618 9	608 9	6 00	5 64	NM	NM	NM	5 90	_	-	NM	NM	NM	
MW-16	1992/1993	620 21	620 60	66 0	40	14 0	616 2	606 2	5 50	5 1 <b>7</b>	NM	NM	NM	5 25			NM	NM	NM	-
MW-18	3/7/1990	629 70	629 83	53 0	28 3	33 3	601 4	596 4	15 19	14 54	14 10	13 79	14 27	NM	-	-		-	-	NM
MW-19D	9/5/2000	630 20	630 51	39 0	23 0	33 0	607 2	597 2	<b>15</b> 63	15 29	14 61	16 61	NM	15 51	-		14 60		NM	-
MW-19I	5/1/2001	630 20	630 52	28 0	180	28 0	6122	602 2	14 46	15 02	NM	15 70	NM	15 41			NM	14 49	NM	15 38
MW-19S	10/4/2000	630 23	630 55	200	100	20 0	620 2	610 2	14 57	14 21	13 52	13 39	NM	13 65	13 07		12 23	12 95	NM	13 42
MW-20	9/6/2000	629 00	629 54	180	80	180	621 0	611 0	12 38	12 28	11 82	11 84	12 92	14 58		-		_		-
MW-21	9/6/2000	629 27	629 76	18 0	80	180	621 3	611 3	13 83	13 50	12 97	12 86	14 11	13 70	-	-	12 95	-	-	_
MW-22	9/7/2000	629 41	629 87	22 0	100	20 0	619 4	609 4	14 81	14 62	14 00	13 96	14 67	12 30	14 73		13 87		_	
MW-23D	9/8/2000	633 39	631 15	<b>42</b> 0	31 0	41 0	602 4	592 4	14 50	14 63	NM	13 86	15 14	14 67	-		NM			
MW-23I	9/8/2000	633 38	631 19	27 0	15 2	25 2	618 2	608 2	13 71	13 73	NM	12 88	14 35	13 73	-		NM	_		-
MW-23S	9/7/2000	633 50	631 32	130	30	130	630 5	620 5	11 72	11 75	10 78	10 69	12 <i>7</i> 8	11 71	-		-		-	
MW-24D	9/12/2000	624 81	624 88	26 0	20 0	25 0	604 8	599 8	9 81	7 09	NM	NM	NM	NM	_	-	NM	NM	NM	NM
MW-24I	9/12/2000	624 68	624 70	180	130	180	611 7	606 7	6 81	6 97	NM	NM	NM	NM	_	-	NM	NM	NM	NM
MW-24S	9/12/2000	624 73	624 75	120	70	120	617 7	612 7	n/a	6 24	NM	NM	NM	NM	n/a		NM	NM	NM	NM
MW-25D	9/13/2000	625 70	625 83	30 0	25 0	30 0	600 <i>7</i>	595 7	8 69	8 82	NM	NM	NM	NM	-	-	NM	NM	NM	NM
MW-25I	9/12/2000	625 99	626 00	20 0	100	20 0	616 0	606 0	9 50	9 56	NM	NM	NM	NM	9 42		NM	NM	NM	NM
MW-25S	9/12/2000	616 48	616 50	55	05	5 5	616 0	611 0	0 60	0 04	NM	NM	NM	NM	-	-	NM	NM	NM	NM
MW-26	9/14/2000	631 25	631 25	150	50	150	626 3	616 3	6 38	6 21	NM	4 99	7 60	5 80			NM			-
MW-27D	9/13/2000	631 20	631 39	490	35 0	45 0	596 2	586 2	16 10	16 45	NM	15 62	16 35	16 46			NM	_	-	-
MW-27I	9/14/2000	631 22	631 36	30 0	20 0	30 0	611 2	601 2	11 50	11 20	NM	10 42	11 89	11 23	-	-	NM			-
MW-27S	9/14/2000	631 03	631 24	170	50	15 0	626 0	616 0	8 80	8 65	NM	7 63	9 66	8 45	_		NM			
MW-28S	9/14/2000	628 05	628 05	195	95	195	618 6	608 6	13 15	13 28	12 41	12 41	13 45	13 33	-	-		_		_
MW-29S	9/14/2000	NS	634 60	170	50	150	n/a	n/a	n/a	14 65	15 35	16 01	17 20	16 32	-	-	11 82	10 25	13 57	12 31
MW-30S	9/14/2000	NS	631 30	170	50	15 0	n/a	n/a	n/a	7 14	7 85	8 20	14 48	7 45	n/a	-	4 84	4 44	7 44	5 85
MW-101	4/19/2001	620 15	620 52	80	30	80	617 2	612 2	NM	5 65	4 88	4 62	6 35	5 78	NM			-		-
MW-102	4/19/01	620 48	621 07	100	30	80	617 5	612 5	NM	5 86	4 93	4 23	7 60	6 22	NM		4 90		-	_
MW-103D	4/25/2001	620 39	620 78	180	13 0	18 0	607 4	602 4	NM	5 07	NM	5 25	5 97	6 10	NM	n/a	NM			-

#### MONITORING WELL CHARACTERISTICS AND WATER LEVEL DATA FORMER ROCKWELL INTERNATIONAL CORPORATION ALLEGAN, MICHIGAN

		TOC	Ground	Well	Depth to	Depth to	Top of	Bottom of												
	Installation		Elevation	Depth	TOS	BOS	Screen	Screen			Depth to V	,					•	NAPL (feet)		
Location	Date	(ft AMSL)	(ft AMSL)	(feet)	(feet)	(feet)	(ft AMSL)	(ft AMSL)	10/1/2000		11/6/2001					5/11/2001	11/6/2001	5/15/2002	8/12/2002	
MW-103S	4/23/2001	620 61	620 99	100	45	95	616 1	611 1	NM	5 82	5 22	5 00	6 09	6 99	NM	n/a		-	-	6 98
MW-104	4/24/2001	631 10	631 68	160	90	<b>14</b> 0	622 1	617 1	NM	11 73	11 40	11 29	12 15	11 76	NM		-	-		_
MW-105	4/20/2001	629 77	630 01	180	100	150	6198	6148	NM	9 94	10 00	9 36	11 40	10 83	NM				-	
MW-106	4/25/2001	627 31	627 49	120	75	125	6198	6148	NM	9 01	8 25	7 <b>7</b> 9	10 26	9 51	NM	n/a				_
MW-107	4/20/2001	630 80	631 04	140	80	13 0	622 8	6178	NM	10 12	10 05	9 42	11 58	NM	NM	_		-	-	NM
MW-108	4/20/2001	631 80	632 02	140	70	120	624 8	6198	NM	9 40	8 43	7 93	NM	8 93	NM			-	NM	
MW-109	4/24/2001	630 40	630 79	160	90	14 0	621 4	616 4	NM	11 97	11 51	11 38	12 79	11 98	NM		-	-		-
MW-110	4/20/2001	631 09	631 33	140	80	13 0	623 1	618 1	NM	12 42	12 54	12 45	NM	NM	NM	NM	8 23	8 14	NM	NM
MW-111	4/19/2001	630 78	631 03	100	40	90	626 8	621 8	NM	5 46	4 62	4 05	7 15	5 47	NM	_			-	
MW-112	4/19/2001	630 83	631 24	38 0	23 0	28 0	6078	602 8	NM	16 23	15 57	NM	NM	16 40	NM	_	_	NM	NM	
MW-113	4/24/2001	627 17	627 81	160	95	14 5	6177	612 7	NM	12 08	11 25	11 35	12 33	12 11	NM	_			_	
MW-114	4/24/2001	623 75	624 34	180	80	13 0	6158	6108	NM	8 85	8 03	7 98	9 04	8 98	NM		_	-		-
MW-115	4/26/2001	630 38	630 62	140	80	13 0	622 4	6174	NM	10 83	10 39	10 34	11 48	10 80	NM	_	_	_		-
MW-116	4/23/2001	631 33	631 71	120	50	100	626 3	621 3	NM	6 92	6 37	5 54	7 73	6 72	NM	_	_		_	_
MW-117	4/19/2001	630 59	630 76	120	55	105	625 1	620 1	NM	5 02	4 85	3 20	6 71	4 65	NM	_	4 68	2 90	5 94	4 61
MW-118	4/18/2001	631 19	631 40	120	55	105	625 7	620 7	NM	5 12	4 45	3 10	6 79	5 22	NM			_	_	
MW-119	4/23/2001	631 12	631 48	120	40	90	627 1	622 1	NM	5 74	4 87	3 54	7 05	5 70	NM	_	-		_	_
MW-120	4/20/2001	630 93	631 25	160	90	14 0	621 9	616 9	NM	10 87	10 32	10 30	7 7 <b>1</b>	10 90	NM	_			_	
MW-121	4/19/2001	630 45	631 19	140	80	13 0	622 5	617 5	NM	10 34	9 60	9 74	NM	NM	NM	_			NM	NM
MW-122	4/25/2001	631 10	631 40	18 0	130	18 0	618 1	613 1	NM	14 39	13 80	13 88	14 63	14 40	NM		_			_
MW-123	4/18/2001	624 17	624 45	140	60	11 0	618 2	613 2	NM	7 66	NM	NM	NM	NM	NM	_	NM	NM	NM	NM
MW-124	4/20/2001	620 53	620 92	80	30	80	617 5	612 5	NM	4 53	3 48	3 10	4 56	3 57	NM	n/a	3 45	_		-
MW-125	4/19/2001	630 97	631 43	120	70	120	624 0	619 0	NM	8 30	7 67	7 83	9 93	NM	NM	<u>-</u>				NM
MW-128D	4/26/2001	626 35	626 53	190	140	190	612 4	607 4	NM	11 75	11 06	10 97	11 75	11 94	NM	_			_	
MW-128S	4/25/2001	625 91	626 48	22 0	70	120	618 9	613 9	NM	11 30	10 54	9 56	11 37	n/a	NM		_	_	_	n/a
MW-129	4/30/2001	630 61	631 13	120	45	95	626 1	621 1	NM	8 88	NM	7 11	NM	8 90	NM	_	NM	_	NM	
MW-131	4/26/2001	630 92	631 43	36 0	23 0	28 0	607 9	602 9	NM	16 35	15 35	15 40	16 14	16 17	NM		_	_		
MW-132	4/24/2001	629 88	630 12	20 0	13 0	180	616 9	611 9	NM	14 54	13 76	14 00	14 84	14 60	NM	_				
MW-133	4/26/2001	631 48	631 64	100	40	90	627 5	622 5	NM	NM	8 23	8 81	9 11	9 25	NM	NM	_	_	_	
MW-134	4/24/2001	622 22	622 46	100	50	100	617 2	612 2	NM	7 23	6 44	6 39	7 47	7 31	NM		_			
MW-135	4/24/2001	630 91	631 11	180	100	160	620 9	614 9	NM	13 01	11 73	11 61	13 60	12 72	NM	_				_
MW-137	4/26/2001	629 54	629 84	14 0	80	13 0	621 5	616 5	NM	9 72	9 21	9 17	10 45	9 70	NM	_	_			
MW-139	4/25/2001	631 13	631 28	14 0	90	14 0	622 1	617 1	NM	11 04	10 49	10 45	11 98	11 10	NM		_	_	_	
MW-142	4/25/2001	631 52	631 68	160	10 0	15 0	621 5	616 5	NM	12 40	12 00	NM	12 89	12 37	NM			NM		_
MW-144	4/20/2001	626 64	627 30	14 0	85	13 5	618 1	613 1	NM	10 38	NM	NM	NM	NM	NM		NM	NM	NM	NM
P-12	Feb 1990	623 11	620 55	28 0	40	14 0	619 1	609 1	NM	7 68	NM	5 16	8 04	NM	NM		NM		_	NM
P-13	2/8/1990	634 37	631 39	34 0	13 0	23 0	621 4	611 4	NM	18 40	17 69	17 90	18 70	NM	NM	_				NM
P-14	2/11/1990	631 15	631 69	53 0	12 0	22 0	619 2	609 2	NM	17 30	13 95	14 02	NM	NM	NM	_	13 85	_	NM	NM
P-15	Feb 1990	634 39	631 67	24 0	n/a	n/a	n/a	n/a	NM	NM	NM	6 28	9 09	7 81	NM	NM	NM	_		
P-16	Feb 1990	629 81	627 14	20 0	25	12.5	627 3	6173	NM	NM	NM	4 98	9 02	NM	NM	NM	NM	_		NM
P-17	2/26/1990	630 59	631 07	47 O	140	24 0	616 6	606 6	NM	16 32	14 72	15 00	15 96	NM	NM		14 27	14 45	15 31	-
P-18	Feb 1990	666 92	664 40	475	41 6	46 6	625 3	620 3	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
P-19	Feb 1990	620 49	617 90	130	20	120	618 5	608 5	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
P-20	Feb 1990	624 21	624 90	45 0	40	14 0	620 2	610 2	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
P-21	Feb 1990	631 57	632 00	170	70	170	624 6	614 6	NM	NM	NM	5 00	7 40	5 72	NM	NM	NM	1/1/1		
1-51	1.60 1330	031 37	032 00	17 0	7 0	17 U	024 0	0140	IAIAI	INIVI	INIVI	5 00	/ 10	5/2	1.41.41	1 4 1 4 1	1 4141			

## MONITORING WELL CHARACTERISTICS AND WATER LEVEL DATA FORMER ROCKWELL INTERNATIONAL CORPORATION ALLEGAN, MICHIGAN

		Wate	r Level Ele	vation (ft A	AMSL)			LNAPL	. Thickness	(ınches)		
Location	10/1/2000	5/11/2001	11/6/2001	5/15/2002	8/12/2002	6/10/2003	10/1/2000	5/11/2001	11/6/2001	5/15/2002	8/12/2002	6/10/2003
MW-1	618 63	615 05	615 46	615 03	613 88	614 96	Sheen	_	42	101	14 4	12
MW-2A	614 93	620 17	621 02	621 13	617 96	620 02	_		_	_		_
MW-2B	617 61	614 06	614 81	614 87	614 13	614 03			_			_
MW-2C	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
MW-3	NM	616 08	616 49	616 78	615 91	615 94	NM	_	_			_
MW-4A	612 64	614 66	615 39	615 31	610 61	614 11	18 0	_	98	9	56 52	138
MW-4B	614 33	615 15	615 86	615 93	615 14	615 01		_	01			_
MW-4C	614 33	615 18	615 89	615 94	615 22	615 02			04	_	_	
MW-5A	619 95	620 57	621 21	621 27	618 90	620 32	_		_	_	_	
MW-5B	617 94	618 74	619 24	619 63	618 10	618 78			_		_	_
MW-5C	622 84	623 66	623 76	625 43	624 13	624 41	Sheen	_	_		-	_
MW-6	NM	616 65	617 28	617 39	616 20	616 27	NM		_			_
MW-7	614 79	615 19	616 02	616 37	615 13	615 01			_			_
MW-8	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
MW-9	NM	617 42	NM	618 36	615 80	616 98	NM	_	NM	_		
MW-10	622 59	622 06	623 57	NM	NM	NM	20		68	NM	NM	NM
MW-11	622 65	NM	NM	625 36	622 34	623 70		NM	NM	_		_
MW-12	NM	571 68	623 82	624 73	623 78	624 13	NM	_	_		_	_
MW-13	626 20	625 91	NM	627 36	624 22	NM			NM	_		NM
MW-14	620 42	619 38	NM	621 13	619 20	620 19			NM	-		_
MW-15	614 87	615 23	NM	NM	NM	614 97	_		NM	NM	NM	
MW-16	614 71	615 04	NM	NM	NM	614 96	_		NM	NM	NM	_
MW-18	614 51	615 16	615 60	615 91	615 43	NM		_			_	NM
MW-19D	614 57	614 91	615 59	613 59	NM	614 69		_	01		NM	
MW-19I	615 74	615 18	NM	614 50	NM	614 79	Sheen		NM	14 52	NM	0 36
MW-19S	615 66	616 02	616 71	616 84	NM	616 58	18 0		15 5	5 28	NM	2 76
MW-20	616 62	616 72	617 18	617 16	616 08	614 42	_	_			_	_
MW-21	615 44	615 <i>7</i> 7	616 30	616 41	615 16	615 57	Sheen		02	_	_	
MW-22	614 60	614 79	615 41	615 45	614 74	617 11	10	_	16			_
MW-23D	618 89	618 76	NM	619 53	618 25	618 72			NM	_		_
MW-23I	619 67	619 65	NM	620 50	619 03	619 65			NM	_		_
MW-23S	621 78	621 75	622 72	622 81	620 72	621 79		_	_			_
MW-24D	615 00	617 72	NM	NM	NM	NM		_	NM	NM	NM	NM
MW-24I	617 87	617 71	NM	NM	NM	NM		_	NM	NM	NM	NM
MW-24S	n/a	618 49	NM	NM	NM	NM	30	_	NM	NM	NM	NM
MW-25D	617 01	616 88	NM	NM	NM	NM	_	_	NM	NM	NM	NM
MW-25I	616 49	616 43	NM	NM	NM	NM	10	_	NM	NM	NM	NM
MW-25S	615 88	616 44	NM	NM	NM	NM	Sheen		NM	NM	NM	NM
MW-26	624 87	625 04	NM	626 26	623 65	625 45	-	_	NM			_
MW-27D	615 10	614 75	NM	615 58	614 85	614 74		_	NM		_	_
MW-27I	619 72	620 02	NM	620 80	619 33	619 99		_	NM		_	_
MW-27S	622 23	622 38	NM	623 40	621 37	622 58	-	_	NM			-
MW-28S	614 90	614 77	615 64	615 64	614 60	614 72	_	_		-	_	_
MW-29S	n/a	n/a	n/a	n/a	n/a	#VALUE	Sheen	_	42 4	69 12	43 56	48 12
MW-30S	n/a n/a		-		•	#VALUE	8 0	_	36 1	45 12	84 48	192
MW-101	ny a NM	n/a 614 50	n/a 415.27	n/a 615.52	n/a 412.80		NM	-		40 12	O4 40 	
MW-101	NM NM	614 50	615 27 615 55	615 53 616 25	613 80 612 88	614 37 614 26	NM NM		- 04	_	_	
		614 62						<u>-</u> Y				
MW-103D	NM	615 32	NM	615 14	614 42	614 29	NM	1	NM	_	_	

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## MONITORING WELL CHARACTERISTICS AND WATER LEVEL DATA FORMER ROCKWELL INTERNATIONAL CORPORATION ALLEGAN, MICHIGAN

		Wate	r Level Ele	vation (ft A	AMSL)			LNAPL	Thickness	(ınches)		
Location	10/1/2000	5/11/2001	11/6/2001	5/15/2002	8/12/2002	6/10/2003	10/1/2000	5/11/2001	11/6/2001	5/15/2002	8/12/2002	6/10/2003
MW-103S	NM	614 79	615 39	615 61	614 52	613 62	NM	Y	_		-	0 12
MW-104	NM	619 37	619 70	619 81	618 95	619 34	NM		-		-	
MW-105	NM	619 83	619 <i>7</i> 7	620 41	618 37	618 94	NM	_		_		-
MW-106	NM	618 30	619 06	619 52	617 05	617 80	NM	Y				
MW-107	NM	620 68	620 75	621 38	619 22	NM	NM	-	_	-	-	NM
MW-108	NM	622 40	623 37	623 87	NM	622 87	NM	_	-	_	NM	-
MW-109	NM	618 43	618 89	619 02	617 61	618 42	NM		_		-	~
MW-110	NM	618 67	618 55	618 64	NM	NM	NM	Y	51 <i>7</i>	51 72	NM	NM
MW-111	NM	625 32	626 16	626 73	623 63	625 31	NM	_		-		-
MW-112	NM	614 60	615 26	NM	NM	614 43	NM	_	-	NM	NM	-
MW-113	NM	615 09	615 92	615 82	614 84	615 06	NM		_		-	
MW-114	NM	614 90	615 72	615 <i>7</i> 7	614 71	614 77	NM	-	-		-	~
MW-115	NM	619 55	619 99	620 04	618 90	619 58	NM	-	Sheen		_	~
MW-116	NM	624 41	624 96	625 79	623 60	624 61	NM		_		_	
MW-117	NM	625 57	625 74	627 39	623 88	625 94	NM	-	20	36	92	0 48
MW-118	NM	626 07	626 74	628 09	624 40	625 97	NM	-	-	-	-	-
MW-119	NM	625 38	626 25	627 58	624 07	625 42	NM	_		_	-	-
MW-120	NM	620 06	620 61	620 63	623 22	620 03	NM		Sheen			-
MW-121	NM	620 11	620 85	620 71	NM	NM	NM	_	Sheen	_	NM	NM
MW-122	NM	616 71	617 30	617 22	616 47	616 70	NM	-	-	_	-	-
MW-123	NM	616 51	NM	NM	NM	NM	NM		NM	NM	NM	NM
MW-124	NM	616 00	617 05	617 43	615 97	616 96	NM	Y	04	-		-
MW-125	NM	622 67	623 30	623 14	621 04	NM	NM	-	-	-	_	NM
MW-128D	NM	614 60	615 29	615 38	614 60	614 41	NM	-	Sheen	-		-
MW-128S	NM	614 61	615 37	616 35	614 54	n/a	NM		_		-	#VALUE
MW-129	NM	621 73	NM	623 50	NM	621 71	NM	_	NM	-	NM	
MW-131	NM	614 57	615 57	615 52	614 78	614 75	NM	-		-	_	
MW-132	NM	615 34	616 12	615 88	615 04	615 28	NM	-	Sheen	-		-
MW-133	NM	NM	623 25	622 67	622 37	622 23	NM	NM	-	-		-
MW-134	NM	614 99	615 78	615 83	614 75	614 91	NM	-			-	•
MW-135	NM	617 90	619 18	619 30	617 31	618 19	NM	-		-	_	
MW-137	NM	619 82	620 33	620 37	619 09	619 84	NM					-
MW-139	NM	620 09	620 64	620 68	619 15	620 03	NM		Sheen		-	-
MW-142	NM	619 12	619 52	NM	618 63	619 15	NM		_	NM		
MW-144	NM	616 26	NM	NM	NM	NM	NM	-	NM	NM	NM	NM
P-12	NM	615 43	NM	617 95	615 07	NM	NM	-	NM	-		NM
P-13	NM	615 97	616 68	616 47	615 67	NM	NM	-	Sheen	-		NM
P-14	NM	613 85	617 20	617 13	NM	NM	NM		12	-	NM	NM
P-15	NM	NM	NM	628 11	625 30	626 58	NM	NM	NM			_
P-16	NM	NM	NM	624 83	620 79	NM	NM	NM	NM			NM
P-17	NM	614 27	615 87	615 59	614 63	NM	NM		54	66	78	
P-18	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
P-19	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
P-20	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
P-21	NM	NM	NM	626 57	624 17	625 85	NM	NM	NM			

Page 5 of 5 TABLE 1

#### MONITORING WELL CHARACTERISTICS AND WATER LEVEL DATA FORMER ROCKWELL INTERNATIONAL CORPORATION ALLEGAN, MICHIGAN

#### Notes:

NM - not measured

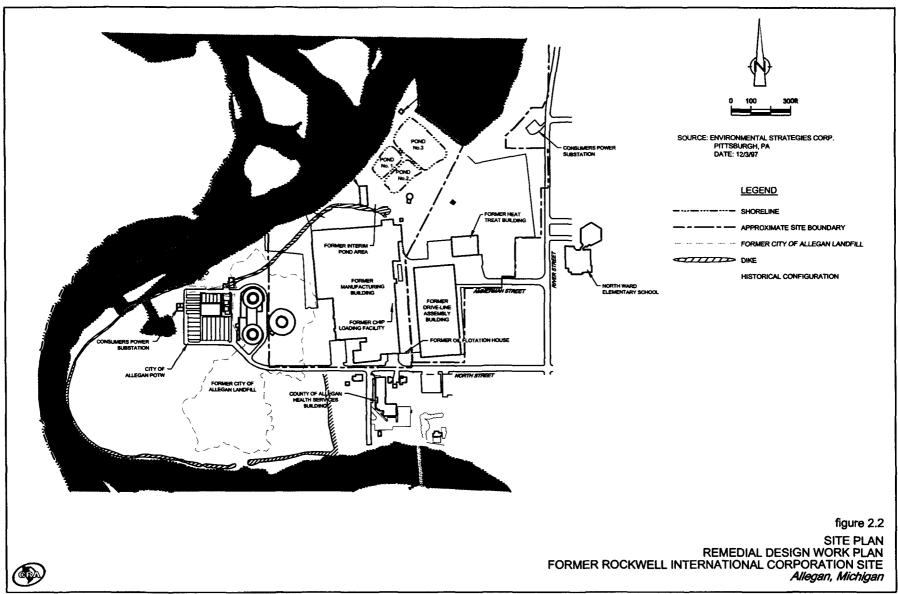
ft AMSL - feet above mean sea level

n/a - information not available

TOS - Top of Screen

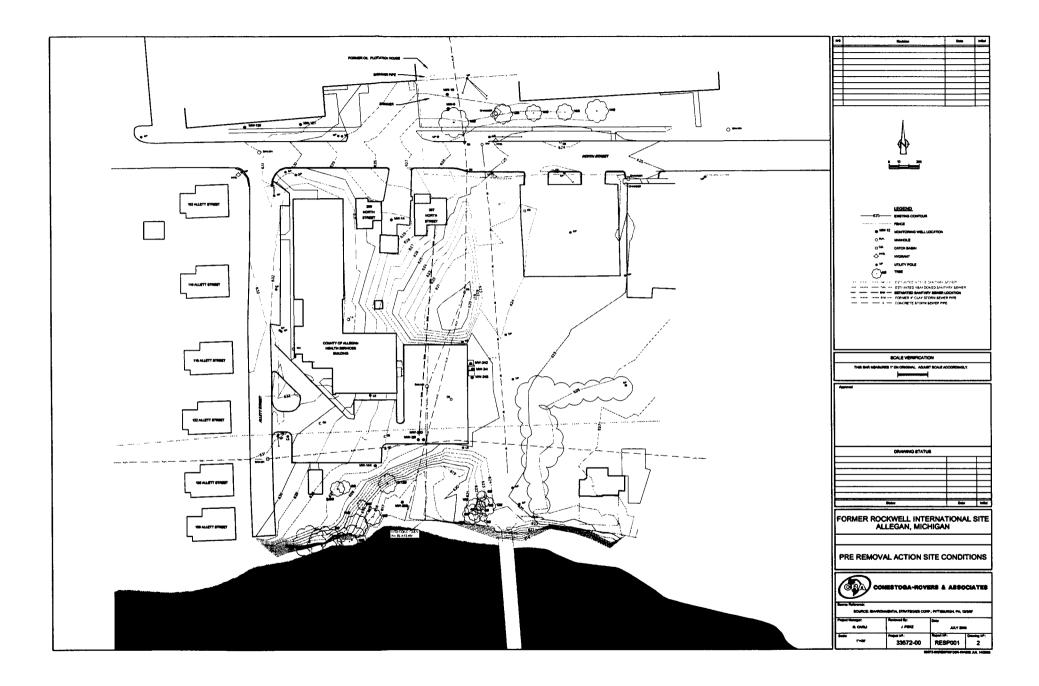
BOS - Bottom of Screen

Y - indicates the presence of product has been observed at this location on at least one occasion — no product has been observed at this location to date



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# EPA Information Requests Directed to Rockwell International Corporation: Allegan Plant, Allegan, Michigan (now ArvinMeritor, Inc.)

### Legend:

- "F-x" means Finding No. F-x filed in a proposed Findings and Conclusions document filed with the United States District Court for the Western District of Michigan
- "L-y" means Legal Conclusion No. L-y in a proposed Findings and Conclusions document.

Col. 1	Col. 2	Col. 3
EPA Reqst No.	ArvinMeritor's Proposed Findings and Conclusions Nos.	Comments
1		
2		See table
3		See witness lists
4		See cover letter
5	Filed August 27, 1998, by ArvinMeritor: F-96 through F-127	Historical Activities Reconstruction Report, pp. 3-32
6	Filed August 27, 1998, by ArvinMeritor: F-96 through F-127	See preliminary responses
7	Filed August 27, 1998, by ArvinMeritor:	See preliminary responses and Historical Activities
	F-96 through F-127	Reconstruction Report, pp. 37-40
8	Filed August 27, 1998, by ArvinMeritor: F-96 through F-127	Historical Activities Reconstruction Report, pp. 33-39
9	Filed August 27, 1998, by ArvinMeritor:	Historical Activities Reconstruction Report, pp. 33-3
	F-96 through F-127	
10	Filed August 27, 1998, by ArvinMeritor: F-96 through F-127	Historical Activities Reconstruction Report, pp. 26-31
11	Filed August 27, 1998, by ArvinMeritor: F-96 through F-127	Historical Activities Reconstruction Report, pp. 37-40
	Filed December 3, 1999, by ArvinMeritor: F-29 through F-65	
12	Filed August 27, 1998, by ArvinMeritor: F-96 through F-127	Historical Activities Reconstruction Report, pp. 37-40
	Filed December 3, 1999, by ArvinMeritor: F-29 through F-65	
13	Filed August 27, 1998, by ArvinMeritor F-96 through F-127	Historical Activities Reconstruction Report, pp. 37-40
	Filed December 3, 1999, by ArvinMeritor: F-29 through F-65	
14	Filed August 27, 1998, by ArvinMeritor: F-96 through F-127	
	Filed December 3, 1999, by ArvinMeritor: F-29 through F-65	

Col. 1	Col. 2	Col. 3
	A	
EPA Reqst No.	ArvinMeritor's Proposed Findings and Conclusions Nos.	Comments
15	Filed August 27, 1998, by ArvinMeritor: F-96 through F-127	
	Filed December 3, 1999, by ArvinMeritor: F-29 through F-65	
16	Filed August 27, 1998, by ArvinMeritor: F-96 through F-127	
	Filed December 3, 1999, by ArvinMeritor: F-29 through F-65	
17		See Attachment A
18		See Attachment B
19		See preliminary responses
20		No information
21		No information
22	Filed December 3, 1999, by ArvinMeritor: F-34 through F-36	See preliminary responses
23	Filed December 3, 1999, by ArvinMeritor: F-34 through F-36	See preliminary responses
24	Filed December 3, 1999, by ArvinMeritor: F-34 through F-36	See preliminary responses
25	Filed December 3, 1999, by ArvinMeritor: F-34 through F-36	See preliminary responses
26	Filed December 3, 1999, by ArvinMeritor: F-34 through F-36	
27	Filed December 3, 1999, by ArvinMeritor: F-34 through F-36	
28	Filed December 3, 1999, by ArvinMeritor: F-34 through F-36	Historical Activities Reconstruction Report, pp. 33-35
29	Filed December 3, 1999, by ArvinMeritor: F-34 through F-36	Historical Activities Reconstruction Report, pp. 33-35
30	Filed December 3, 1999, by ArvinMeritor: F-34 through F-36	See Attachment C
31		Historical Activities Reconstruction Report, pp. 37-40
32		Historical Activities Reconstruction Report, pp. 37-40
33		No information
34		See preliminary responses
35		See preliminary responses
36		See preliminary responses
37		See preliminary responses
38		See preliminary responses
39		See preliminary responses
40		See Attachment D
41		See preliminary responses
42		See preliminary responses
43		See preliminary responses
44		See preliminary responses
45		See data and reports cited in cover letter
46		See preliminary responses
47		See preliminary responses

Col. 1	Col. 2	Col. 3
EPA Reqst No.	ArvinMeritor's Proposed Findings and Conclusions Nos.	Comments
48		See preliminary responses
49	Filed August 27, 1998, by ArvinMeritor: F-1 through F-34; F-128 through F-200	
	Filed December 3, 1999, by ArvinMeritor: F-72 through F-153	

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## UNITED STATES DISTRICT COURT WESTERN DISTRICT OF MICHIGAN SOUTHERN DIVISION

Plaintiff,		
v.	Civil Action No. 1:95CV838	
Rockwell International, et al.,	Hon. Robert Holmes Bell	
Defendants.		
/	-	

# AND CONCLUSIONS OF LAW SUBMITTED BY DEFENDANTS EATON AND ROCKWELL

Defendants Eaton Corporation and Rockwell International Corporation, by their attorneys, Dykema Gossett PLLC, hereby submit Revised Proposed Findings of Fact and Conclusions of Law, superseding those submitted by defendants on August 5, 1998. These Revised Findings have been amended to conform to the proofs submitted at trial. The proofs adduced at trial for each proposed Finding are indicated in parentheses at the conclusion of each numbered paragraph.

These Findings and Conclusions are supported by:

- -- Trial testimony (indicated by witness name, date of testimony and, in the case of witness Mark Brown, whose testimony has been transcribed, page number);
- -- Deposition testimony (indicated by witness name and page numbers) located in Bench Books provided to the Court by the parties, containing designated excerpts of deponents;
- -- Trial exhibits (indicated by Trial Exhibit number);

- -- Admissions by plaintiff or its counsel (indicated by a reference to the specific pleadings and discovery documents). Frequently these admissions are contained in Plaintiff's Responses to certain undisputed facts offered by Eaton and Rockwell when defendants moved for summary judgment. The fact in question is contained in the List of Undisputed Facts accompanying the Brief in Support of Motion for Summary Judgment, filed by Eaton and Rockwell on February 2, 1998. Plaintiff's Responses are found in Exhibit A to Plaintiff's Brief in Opposition to the Motions for Summary Judgment: plaintiff's briefs are dated March 4, 1998. For the Court's convenience, a "cut-and-paste" version has been prepared, showing the pertinent factual statement from defendant's motion papers and, immediately beneath it, the admission or response by plaintiff. Those "cut-and-paste" editions are attached here as Attachments A (Eaton) and B (Rockwell).
- -- Pleadings by the parties, cited by title or date.
- -- Uncontroverted Facts to which the parties have stipulated. These are set out in Attachment C to the Joint Final Pretrial Order submitted to the Court on August 7, 1998.
- -- **Opinions** of this Court in this case (indicated by citation to <u>KRSG v. Rockwell</u>, et al., and date of opinion).

Proposed findings of fact are labeled as "F-1," "F-2," etc. Proposed conclusions of law are labeled as "L-1," "L-2," etc.

#### I. BACKGROUND

- F-1. This matter was tried to the bench from August 10, 1998 to August 17, 1998. These Findings and Conclusions are issued in accordance with Fed. R. Civ. P. 52(a). The Court has considered opening statements of counsel, written closing arguments of counsel, proposed Findings and Conclusions from both parties, the testimony of witnesses at trial, documents and photos admitted as exhibits at trial, and deposition excerpts designated by the parties in the Joint Final Pretrial Order. Some of the evidence offered by the parties is direct evidence, some is circumstantial. The Court has also considered what inferences can reasonably be drawn from the direct and circumstantial evidence, and has considered the demeanor and manner of the witnesses in assessing credibility of and weight to be accorded to the testimony of witnesses, including experts.
- F-2. In August 1990, The Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site ("NPL Site") was added to the National Priorities List ("NPL") by the United States Environmental Protection Agency ("USEPA"). The NPL Site is a 35-mile length of the Kalamazoo River from the confluence of Portage Creek with the River (in the City of Kalamazoo) to the Allegan City Dam, and a three-mile portion of the Portage Creek in the City of Kalamazoo. (Uncontroverted Facts, ¶ 2. Pleading: Restated First Amended Complaint. ¶¶ 2 and 18; Admission: Plaintiff's Response to Eaton's List of Undisputed Facts for Summary Judgment, ¶ 1, hereafter "Pltf's Response to Eaton Facts, ¶\_", attached to these Revised Findings as Attachment A.)
- F-3. Plaintiff is an unincorporated association of four paper companies: Allied Paper Inc. ("Allied"), Georgia-Pacific Corporation ("Georgia-Pacific"), James River Paper Company

("James River"), and Simpson-Plainwell Paper Company ("Simpson"). (Uncontroverted Facts, ¶ 1.)

- F-4. In 1990, the Michigan Department of Natural Resources (now the Michigan Department of Environmental Quality) ("MDNR" or "MDEQ") identified three paper mills -- Allied, Georgia-Pacific and Simpson -- as the principal sources of polychlorinated biphenyls ("PCBs") contaminating the NPL Site. (**Trial Exh. 8803:** Administrative Order By Consent. ¶¶ 9, 9a and 9b; **Trial Exh. 8810:** March 1997, MDEQ Briefing Report..)
- F-5. Following the listing of the Site on the NPL, in December 1990, Allied, Georgia-Pacific, and Simpson entered into an Administrative Order by Consent (AOC) with MDNR to fund and conduct a Remedial Investigation/Feasibility Study of the NPL Site, including landfills and properties contiguous to the NPL Site. (Uncontroverted Facts, ¶ 5. Trial Exh. 8803: AOC, Attachment 1, "Statement of Work -- Remedial Investigation" at 1.)
- F-6. The landfills contained within the AOC Scope of Work were used to dispose of paper making residuals or "sludges" from the KRSG members' mills and some were also identified as potential sources of continuing PCB releases to the River. The landfill operable units that are part of the Site investigation ("OUs") include: (1) Allied Paper, Inc/Bryant Mill Pond (operated by Allied); (2) Willow Boulevard/A-Site (operated by Georgia-Pacific); (3) King Highway Landfill (operated by Georgia-Pacific); and (4) the 12th Street Landfill (operated by Simpson). (**Testimony of Brown, Cross-Examination, Aug. 11, 1998, 112-43. Trial Exh.**8912: Map Depicting Landfills Formerly Operated by Plaintiffs.)
- F-7. Although not a party to the AOC, James River has agreed to participate in the conducting and funding of the Remedial Investigation/Feasibility Study process.

(Uncontroverted Facts, ¶ 7. Deposition: Cornelius at 11. Testimony of Brown, Cross-Examination, Aug. 10, 1998, at 64.)

F-8. Plaintiff KRSG filed this action in December 1995, seeking to recover its response costs from eight corporations, including these remaining defendants, alleging that the defendants contributed to the PCB contamination of the NPL Site. Plaintiff's claims are based upon CERCLA, 42 U.S.C. § 9601 et. seq., (specifically upon Sections 107 and 113), the Michigan Natural Resources and Environmental Protection Act ("NREPA"), M.C.L.A. § 324.20101 et seq., and various common law theories. (Pleading: Restated First Amended Complaint.

**Opinion:** KRSG v. Rockwell, et al., Case No. 1:95-CV-838, Mar. 6, 1998, at 3.)

- F-9. Plaintiff has voluntarily dismissed its claims against one defendant (Hercules), has settled with another (Rock-Tenn), and the Court has granted summary judgment in favor of two others (Upjohn and Menasha) and in favor of two of the three Eaton plants alleged by plaintiff to be contributors of PCBs to the River. Only Rockwell and Eaton, for its Battle Creek plant, remain as defendants, and this trial concerned their liability.
- F-10. Defendants have filed counterclaims against plaintiff and its members, alleging that plaintiff's members are responsible for the PCB contamination under Section 113 of CERCLA, NREPA, and various common law theories. (**Pleadings:** Counterclaims of Eaton and Rockwell, dated Sept. 26, 1996.) These counterclaims were also tried to the Court in the same proceeding.
- F-11. The KRSG members admit that waste containing detectable levels of PCBs have been released from their paper-making facilities to either Portage Creek or the Kalamazoo River within the NPL Site. (Admission: Plaintiff's Responses to Eaton and Rockwell's First Set of

Requests for Admissions, dated June 3, 1997, Response Nos. 1, 2, 3, 5, 7, 9. Admission:

Plaintiff's Responses to Pharmacia & Upjohn's First Request for Admissions. dated May 12.

1997, Responses 2 through 9. Admission: Plaintiff's Responses to Rock-Tenn Co.. Mill

Division, Inc's First Requests for Admissions, dated Aug. 11, 1997, Responses 2 through 9.)

F-12. Allied and Georgia-Pacific admit that PCBs released from their facilities have come to be located in the sediments of Portage Creek and the Kalamazoo River. Simpson and James River admit that evidence exists from which it can be inferred that PCBs released from their facilities have come to be located in the sediments of the Kalamazoo River. (Pleadings: Plaintiff's Responses to Eaton and Rockwell's First Set of Requests for Admissions, dated June 3, 1997, Response Nos. 12, 13, 14, 15.)

F-13. The four members of plaintiff KRSG have operated paper recycling mills conducting recycling and deinking operations, adjacent to the Kalamazoo River or Portage Creek, within the NPL Site. (Admission: Pltf's Response to Eaton Facts, ¶ 5, set out in Attachment A to these Revised Findings.)

F-14. Deinking is a process used by paper manufacturers to produce higher quality papers from recycled feedstock. (**Opinion:** <u>KRSG v. Rockwell, et al.</u>, Case No. 1:95-CV-838, Mar. 6, 1998, at 3.)

F-15. This Court has previously found that paper mills which practiced deinking discharged PCBs in much greater quantities than those that merely recycled paper. (**Opinion:** KRSG v. Rockwell, et al., Case No. 1:95-CV-838, Mar. 6, 1998, at 3.)

- F-16. Allied, James River, Georgia-Pacific and Simpson have each contributed PCBs to the NPL Site in large quantities, on a frequent basis, as a result of their deinking and paper recycling operations. (Testimony of Brown, Cross-Examination, Aug. 10, 1998, at 112-43.)
- F-17. The PCBs contributed by these four paper companies to the NPL Site have migrated downstream over time. (Opinion: KRSG v. Rockwell, et al., Case No. 1:95-CV-838, Mar. 6, 1998, at 2. Testimony of Brown, Cross-Examination, Aug. 10, 1998, at 62.

  Testimony of Barrick, Aug. 13, 1998.)
- F-18. In 1997, the Michigan Department of Environmental Quality estimated that approximately 350,000 pounds of PCBs are present at the NPL Site. (Admission: Pltf's Response to Eaton Facts, ¶ 110, set out in Attachment A to these Revised Findings. Trial Exh. 8810: March 1997 MDEQ Briefing Report.)

\* \* \* \* \*

- L-1. The contributions of PCBs to the NPL Site by Allied, James River, Georgia-Pacific and Simpson, individually and together, are in nature, quantity and durability sufficient to require imposing the costs of response activities for the NPL Site upon each of those four parties.
- L-2. Allied, James River, Georgia-Pacific and Simpson are each liable and responsible parties under Section 107 of CERCLA, 42 U.S.C. § 9607, for the PCB contamination of the NPL Site.
- L-3. Plaintiff KRSG, as an unincorporated association of these four paper companies, is a liable and responsible party under Section 107 of CERCLA, 42 U.S.C. § 9607, for the PCB contamination of the NPL Site.

L-4. This Court has previously held that, because its members are liable parties under Section 107 of CERCLA, plaintiff KRSG is restricted to a claim for contribution under CERCLA Section 113 and its counterpart under Michigan's NREPA, against the remaining defendants.

(Opinion: KRSG v. Rockwell, et al., Case No. 1:95-CV-838, Jan. 16, 1998.)

#### II. POLYCHLORINATED BIPHENYLS

- F-19. Polychlorinated biphenyls ("PCBs") were produced in the United States from the 1940s through the 1970s exclusively by Monsanto Industrial Chemicals Company ("Monsanto"), which marketed the compounds under the trade name "Aroclor." (**Opinion:** KRSG v. Rockwell, et al., Case No. 1:95-CV-838, Mar. 6. 1998, at 2.)
- F-20. PCBs were most commonly used in electrical components such as capacitors and transformers, but they were also used in the paper industry. Between 1957 and 1971, a type of carbonless copy paper typically referred to as "NCR paper" incorporated PCBs as an ink carrier or solvent. (Trial Exh. 8017: "PCBs Involvement In The Pulp and Paper Industry", p.2. Versar, Inc., Feb. 1977, at 2. Testimony of Barrick, Aug. 13, 1998.)
- F-21. According to the Michigan Department of Natural Resources, the recycling of carbonless copy paper by the paper companies was a major source of the PCBs at the NPL Site. (Trial Exh. 8812: USEPA Action Memorandum. Testimony of Brown, Cross-Examination, Aug. 10, 1998, at 60. Opinion: KRSG v. Rockwell, et al., Case No. 1:95-CV-838, Mar. 6, 1998, at 2-3.)
- F-22. Aroclor 1242, a mixture of PCBs containing an average of 42 percent chlorine, was sold by Monsanto and used in carbonless copy paper as an ink carrier or solvent during the period 1957-71. The total amount sold for this purpose was 44,162,000 pounds, approximately 28 percent of the total estimated Monsanto sales of PCBs for plasticizer applications and 6.3 percent of total Monsanto domestic sales of PCBs during 1957-71. The average content of Aroclor 1242 in the carbonless copy paper was 3.4 percent. (**Trial Exh. 8017:** "PCBs Involvement In The Pulp and Paper Industry", Versar, Inc., Feb. 1977, at 2.)

F-23. Other PCBs, primarily Aroclor 1254, were used in printing inks. (**Trial Exh. 8017:** "PCBs Involvement In The Pulp And Paper Industry", Versar. Inc. Feb. 1977, at 3. **Testimony of Barrick, Aug. 13, 1998.**)

F-24. A number of authoritative studies have concluded that Aroclor 1254 is found in paper and paperboard products, including the types which were produced and recycled by plaintiff's members' mills. (Testimony of Barrick, Aug. 13, 1998. Testimony of Brown, Rebuttal Cross-Examination, Aug. 17, 1998, at 20-21.)

F-25. Testing of paper residuals in the Allied Operable Unit, Georgia-Pacific's Willow Boulevard/A-Site and King Highway Landfills, and Simpson's 12th Street Landfill by KRSG's environmental consultants (Blasland, Bouck & Lee and Geraghty & Miller) confirms that each of these locations contains multiple detections of Aroclors 1254 and 1260 in addition to Aroclor 1242. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 120, 128, 130-31, 132, 133-34. Trial Exh. 8719: Draft Tech. Memo 7. Table 3-10. Trial Exh. 8738: Tech. Memo 9, Table 3-11. Trial Exh. 8725: Tech. Memo 6, Table 3-9. Trial Exh. 8615: Tech. Memo 8, Table 3-8.) Testing by MDNR in 1987 of James River disclosed Aroclors 1248 and 1254 in the company's landfill residuals, and Aroclors 1242 and 1254 in its outfall to the Kalamazoo River. (Trial Exh. 8023: MDNR Letter re James River sampling results.)

F-26. One industry research study stated, "It has been recognized for several years that effluents from paper mills contain environmentally significant quantities of PCBs . . . . [T]he major source of process contamination by PCBs appears to be carbonless copy paper contained in recycled waste paper." (Trial Exh. 8017: "PCBs Involvement In The Pulp And Paper Industry," Versar, Inc., Feb. 1977, at 3.)

F-27. During the late 1950's through the 1970's, carbonless copy paper was often found in office waste paper and other categories of waste paper commonly referred to as "mixed office waste," "ledger paper" and "colored ledger paper." (**Depositions:** Hanson at 27-30: Gilman at 29-31, 105-108; Lawton at 72-75; Huisman at 24. **Trial Exh. 8012, 8013:** 1976 memos of Brown Company, the predecessor to James River.)

F-28. Aroclor 1248 is found in dielectric fluids used in electrical equipment such as capacitors. Aroclor 1254 is found, in addition to printing inks. in electrical equipment such as transformers. (**Testimony of Barrick, Aug. 13/14, 1998.**)

F-29. PCBs were about 5 to 6 times more costly than petroleum based oils, on a price per gallon basis. (Admission: Pltf's Response to Eaton Facts, ¶ 90, set out in Attachment A to these Revised Findings.) In 1972, mineral oil, a substitute for PCBs in low temperature applications, cost 5 to 6 times less than PCBs. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 165-67.)

F-30. PCBs have unpleasant odors and they create an unpleasant awareness of their presence on the skin. (Admission: Pltf's Response to Eaton Facts. ¶ 91, set out in Attachment A to these Revised Findings.)

F-31. The experts agree that if a source of PCBs is present, PCB concentrations are higher in water containing a higher percentage of solids because of the tendency of PCBs to attach to solids. (Testimony of Connolly, Aug. 14, 1998. Testimony of Brown, Cross-Examination, Aug. 10, 1998, at 77-79.)

F-32. The chemical composition of a PCB compound can be measured and analyzed by gas chromatography (in a process called "Gas Chromatograph/ Electron Capture Detection" or

"GC/ECD"), which results in a computer-generated graph depicting the constituents and levels of constituents found in the PCB sample. (Admission: Pltf's Response to Rockwell Facts, ¶ 26, set out in Attachment B to these Revised Findings. Testimony of Barrick, Aug. 13/14, 1998.)

These graphs or depictions are referred to as "fingerprints."

F-33. GC/ECD graphs of PCB samples can be compared to determine whether two PCB samples are made up of the same or different Aroclors. (Admission: Pltf's Response to Rockwell Facts, ¶27, set out in Attachment B to these Revised Findings. Testimony of Barrick, Aug. 13/14, 1998.)

F-34. The GC/ECD graph of a PCB sediment sample can be compared to the graphs of PCB "standards," controlled samples whose Aroclors are known, in order to identify the particular Aroclor in the sediment sample. (Admission: Pltf's Response to Rockwell Facts, ¶28, set out in Attachment B to these Revised Findings. Testimony of Barrick, Aug. 13/14, 1998.)

#### III. DEFENDANT EATON

- F-35. Upstream of the confluence of Portage Creek and the Kalamazoo River is a body of water called "Morrow Lake" or "Morrow Pond." (**Trial Exh. 8910:** Map of River and Facility Locations.) Morrow Lake is not within the NPL Site as defined by Plaintiff's Restated First Amended Complaint but is within the area that Plaintiff is required by the AOC to study. (**Admission:** Pltf's Response to Eaton Facts, ¶2, set out in Attachment A to these Revised Findings.)
- F-36. The city of Battle Creek is located upstream of Morrow Lake. (**Trial Exh. 8910:** Map of River and Facility Locations. **Admission:** Pltf's Response to Eaton Facts, ¶3, set out in Attachment A to these Revised Findings.)
- F-37. Plaintiff's expert, Dr. Mark Brown of Blasland, Bouck & Lee, estimated that 25 percent of the Kalamazoo River watershed (by water volume) is upstream of Battle Creek. This means that, to the extent PCBs were contributed by upstream sources and not deposited in sediments, those PCBs could be found in the River downstream of Battle Creek. (Testimony of Brown, Cross-Examination, Aug. 10, 1998, at 80-81.)
- F-38. Dr. Brown conceded that plaintiff did not investigate all industries upstream of Eaton's Battle Creek plant that may have discharged to the River. (**Testimony of Brown**, **Cross-Examination**, **Aug. 11**, 1998, at 98-99.)
- F-39. Eaton's former Valve Division plant was located at 463 North 20th Street. Battle Creek, approximately one-half mile from the Kalamazoo River. (Uncontroverted Facts, ¶ 19. Admission: Pltf's Response to Eaton Facts, ¶43, set out in Attachment A to these Revised Findings.)

- F-40. Eaton owned no riparian rights in connection with the former Battle Creek plant.

  (Uncontroverted Facts, ¶ 20.)
- F-41. The former Eaton Battle Creek plant is approximately 15 miles upstream of the upstream-most part of the NPL Site, and is not within the NPL Site as described in Plaintiff's Restated First Amended Complaint. (Admission: Pltf's Response to Eaton Facts. ¶45, set out in Attachment A to these Revised Findings.)
- F-42. The former Eaton Battle Creek plant was located approximately one mile upstream of the Battle Creek Wastewater Treatment Plant (WWTP). (Uncontroverted Facts, ¶ 25.

  Admission: Pltf's Response to Eaton Facts, ¶46. set out in Attachment A to these Revised Findings.)
- F-43. The plant structure no longer exists on the property; it was demolished after Eaton ceased operations there in 1983. (Uncontroverted Facts, ¶ 26.)
- F-44. Plaintiff contends that PCBs were found in oils used in transformers and capacitors (electrical equipment) and in cooling and lubricating oils used in the manufacturing process (process oils). Eaton does not dispute that some of its electrical equipment contained PCB-containing oil. Plaintiff presented no evidence indicating that any PCB-containing oils from electrical equipment made their way into the Kalamazoo River from the Battle Creek plant.
- F-45. Neither Eaton nor any environmental concern conducted PCB testing of soils or groundwater at the Eaton Battle Creek property, and hence there is no testing of soils or groundwater indicating the presence of PCBs on the property. (Admission: Pltf's Response to Eaton Facts, ¶72, set out in Attachment A to these Revised Findings.)

F-46. In 1981, Versar, an outside environmental contractor to USEPA, conducted a PCB audit of the Battle Creek plant. Versar staff visually inspected 65 of the 321 in-service PCB-containing capacitors at the plant, and found no leaks among them. (**Trial Exh. 2059:** 1981 Versar Inspection Report. **Admission:** Pltf's Response to Eaton Facts, ¶57, set out in Attachment A to these Revised Findings.)

F-47. The only other leaks in electrical equipment observed by Versar were in out-of-service transformers, but these were properly kept in storage area for transformers and capacitors, having a welded steel floor and a welded steel six-inch curb, above the 100-year flood plain, with no drains. (**Trial Exh. 2059:** 1981 Versar Inspection Report. **Admission:** Pltf's Response to Eaton Facts, ¶58, set out in Attachment A to these Revised Findings.) The PCB storage facility was inspected at least monthly beginning in December 1978. (**Trial Exh. 6009:** Inspection Logs. **Admission:** Pltf's Response to Eaton Facts, ¶59, set out in Attachment A to these Revised Findings.)

F-48. As of December 1978, transformers and capacitors were inspected monthly for leaks. (**Trial Exh. 6009:** PCB Storage Log. **Admission:** Pltf's Response to Eaton Facts. ¶60. set out in Attachment A to these Revised Findings.)

F-49. The oil in the plant's electrical switching units (or "oil breakers") was tested in 1983, and no detectable levels of PCBs were found. (**Trial Exh. 2064 / 6015**: 1983 letter. McGovern to Heindrichs. **Admission**: Pltf's Response to Eaton Facts, ¶62, set out in Attachment A to these Revised Findings.)

F-50. In June. 1998, although this Court granted summary judgment to Eaton Corporation with respect to its Marshall and Kalamazoo, Michigan, plants, the Court denied

summary judgment with respect to the Battle Creek plant. In so ruling, this Court determined that four possible indicators of PCB use in process oils precluded grant of summary judgment, and that it was necessary to consider those indicators further at trial, when evidence could be weighed. Those four possible indicators are: (1) the detection of PCBs in the wood blocks of the plant floor; (2) the detection of small amounts of PCBs in two effluent samplings in 1972; (3) the alleged purchases in 1970, 1971 and 1972, at approximately the time of the PCB detection in effluent of a small quantity of Pydraul, a PCB-containing hydraulic oil manufactured by Monsanto; and (4) the detection of a small amount of PCBs in grinding swarf from the plant in 1981.

F-51. Having weighed the evidence, this Court concludes that the evidence does not support the probability or likelihood that process oils used at the Battle Creek plant contained PCBs. None of the four possible indicators of PCB use at the plant tend to make more likely the proposition that PCBs were in fact used at the plant, nor do they do so in combination. The evidence, when weighed, indicates that it is unlikely that process oils at the plant contained PCBs.

#### A. The Wood Block Floor.

F-52. In 1983, after plant operations had ceased, the plant was scheduled for demolition. The wood block floor of the plant was tested for PCBs, by taking limited samples around the plant. Varying levels of PCBs were detected in the samples, not all of which were high enough to require disposal of the tested blocks as PCB-contaminated material. (Admission: Pltf's Response to Eaton Facts, ¶64, set out in Attachment A to these Revised Findings. **Depositions:** Heindrichs at 287, 293-94; Howard at 53-55, 75-77.)

F-53. Eaton chose to dispose of the entire floor as though it were required to be sent to a . special PCB landfill, even though not all blocks sampled required such treatment under waste disposal regulations (Admission: Pltf's Response to Eaton Facts, ¶65, set out in Attachment A to these Revised Findings) and even though most areas of the plant were not sampled.

F-54. Out of the approximately 2,865,000 blocks on the floor. 51 blocks were tested by Howard Laboratories. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 196-97.)

Seventeen of the 30 blocks sampled came from so-called "background" areas; the remaining 34 and five others were "biased" samples taken from near transformers or capacitors that were thought to have contained PCBs. There was no attempt to select blocks randomly. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 197-201. Depositions: Heindrichs at 293-94 (directed that samples be taken from areas where capacitors were mounted overhead, and in other areas as well); Howard at 51 (may have been directed by Eaton employees to sample certain areas) Trial Exh. 8930: wood block analytical data and notations concerning sampling locations.) This limited testing is neither representative of the floor as a whole nor probative of

alleged PCB contamination of the rest of the floor. The wood block floor testing does not indicate use of PCBs in process oils at the plant.

#### B. The Detection of PCB in the Plant's Effluent.

F-55. The outfall from the Battle Creek plant to the Kalamazoo River was shared with Clark Equipment Company, which was located on adjacent property. MDNR records identify the location of the outfall as "Clark Equipment Company and Eton [sic] Valve Company." (**Trial Exh. 2027:** MDNR Industrial Effluent Records. **Admission:** Pltf's Response to Eaton Facts, — ¶48, set out in Attachment A to these Revised Findings.)

F-56. In February 1972, MDNR collected a wastewater sample from the joint outfall shared with Clark Equipment company and the municipal sewers. That sample detected 1.4 ppb (expressed in the MDNR report as 1400 parts per trillion) Aroclor 1254. (**Trial Exh. 2027:** List of Industrial Effluents. **Opening Statement of Plaintiff, Aug. 10, 1998.**) Plaintiff's expert, Dr. Brown, concedes that the sample was taken at a point downstream of the Clark and Eaton discharge points (**Testimony of Brown, Aug. 10, 1998, at 39, lines 18-23**), thus indicating that the effluent cannot be attributed to Eaton as opposed to Clark.

F-57. Eaton's expert, Dr. John Connolly, reviewed the report of 1.4 ppb PCBs and testified that the testing was performed on a joint outfall, thus making it impossible to attribute the PCB detection to Eaton as opposed to Clark Equipment Company. Furthermore, he testified, the results do not contain any data regarding flow rate, which are necessary in order to draw conclusions about the amount of PCBs being discharged over time. (**Testimony of Connolly**,

Aug. 14, 1998.) Because this sample came from a "joint" outfall, this detection of PCBs cannot be ascribed to Eaton.

F-58. In September 1972, the MDNR surveyed the wastewater from the facility's storm sewer and measured PCBs at 0.24 ppb and 0.12 ppb in two separate composite samplings.

(Uncontroverted Facts, ¶ 23. Trial Exh. 2028: 1972 Wastewater Survey Report at pages 00006467, 6471. Admission: Pltf's Response to Eaton Facts ¶49, set out in Attachment A to these Revised Findings.)

F-59. Dr. Connolly testified that the sampling performed in September 1972 was flawed-because the storm sewer being sampled served other areas as well. Although plaintiff contends that the outfall was sampled in such a way that only Eaton's product was being tested, that conclusion is not supported by the text of the sampling report. The sampling report contains "net" results for certain other test parameters, but the portion concerning PCB sampling is different and does not indicate any means by which to determine that only Eaton's in-plant effluent was being sampled. Dr. Connolly also testified that these results were suspect because they were at the limit of detectability. (Testimony of Connolly, Aug. 14, 1998.) Plaintiff's expert, Dr. Brown, conceded that sampling for PCB concentrations of less than 1.0 ppb can commonly result, even today, in results that are off by a factor of one hundred percent. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 187.)

F-60. This Court finds Dr. Connolly's testimony and analysis to be credible and persuasive, and rejects plaintiff's experts' opinions using these effluent sampling events as a basis for attributing to Eaton the release of PCBs to the River.

### C. Alleged Purchases of Pydraul.

F-61. Eaton personnel testified, and Eaton records indicate, that the oils used at the plant were supplied by Shell, Arco. Texaco, Mobil, Amoco and Standard. (**Trial Exh. 2047 / 6007:** 1979 Pollution Incident Prevention Plan. **Depositions:** Roosevelt Jones at 59, 163-64; Romick at several designated portions passim.) Plaintiff has not presented any evidence to suggest that oils from any of these suppliers contained PCBs at any time.

F-62. Eaton's own records disclose no indication of having purchased any oils from Monsanto, the exclusive manufacturer of PCBs. There is no testimony from any Eaton employee indicating that process or hydraulic oils were purchased from Monsanto. (**Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 169.**) The few witnesses who were asked expressly about Monsanto products testified that they recalled seeing no fluids at the plant from Monsanto. (**Depositions:** See, e.g., Wolf at 46; Roosevelt Jones at 187; Romick at 6-7, 17-19.) The Stockroom Supervisor at Battle Creek, William Romick, testified that in the 16 to 18 years that he served in that capacity (1965 or so to 1983), Eaton did not purchase oils from Monsanto, and did not purchase Pydraul hydraulic oil. (**Deposition:** Romick at 6-7, 17-19.) Mr. Romick's tenure included the time period during which plaintiff alleges Eaton purchased hydraulic oil from Monsanto.

F-63. Plaintiff presented at trial a custodian of records for the Michigan Department of Environmental Quality. Plaintiff offered this testimony to prove that a document, Trial Exhibit 2016, allegedly prepared by Monsanto and found in the MDEQ records, was a reliable and trustworthy record of sales of Pydraul to the Eaton Battle Creek plant in 1970, 1971 and 1972. The records custodian conceded, however, that he believed that the document may have come to

MDEQ from the USEPA (rather than from Monsanto), and that he did not know anything about who authored the document, what records were used to compile the data, or even how the document came to be located in the MDEQ files. After considering the scant and inadequate foundation provided by the witness, this Court excluded the proffered exhibit from evidence, and has rejected the records custodian's testimony concerning the alleged sale of Pydraul. Plaintiff could have presented the deposition testimony of someone from Monsanto, from USEPA, or from some other source, concerning the facts allegedly set out on the document. Plaintiff did not do so. The record is devoid of any competent and admissible evidence concerning the alleged sale of Pydraul to Eaton's Battle Creek plant.

F-64. The majority of the coolants used at the Battle Creek facility were water soluble coolants. (**Depositions:** Wolf at 22; Raiche at 71.) By the late 1970s, Eaton was using more than twice as much water soluble oil than straight oil at the Battle Creek plant. (**Deposition:** Raiche at 71.)

F-65. Water soluble oils are incompatible with PCBs because PCBs do not readily mix with water. Thus, one would not expect water soluble oil to contain PCBs. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 161-63. Testimony of Crumrine, Cross-Examination, August 13, 1998). There is a basic incompatibility between water-soluble oils and PCBs. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, 162 line 20 through 163 line 2.)

F-66. Any spilling of oil onto the floor of the former Eaton Battle Creek plant was incidental to the manufacturing process, because the process was one of working hard metals, not

manufacturing or processing fluids or chemicals, or of manufacturing or assembling electrical equipment.

F-67. Eaton filed Critical Materials Reports and State of Michigan wastewater surveys from at least 1979 forward. Each of these indicates that fewer than 10 lbs of PCB-containing oils were purchased by the plant annually, and this was for transformer oil. The reports also indicate that no PCB-containing oils were discharged in wastewater. (**Trial Exhs. 2054, 2056, 2057, 2061. Admission:** Pltf's Response to Eaton Facts. ¶63, set out in Attachment A to these Revised Findings.)

F-68. In 1981, Versar inspected the Battle Creek plant. Versar sampled cutting, quench and hydraulic oil in the plant and found no detectable levels of PCBs in the oils sampled. (Trial Exh. 2059: 1981 Versar Inspection Report. Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 177. Admission: Pltf's Response to Eaton Facts, ¶54, set out in Attachment A to these Revised Findings.)

F-69. Plaintiff concedes that Eaton's plant did not conduct die casting operations for which PCBs are ideally suited. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 158.)

F-70. This Court finds no evidence indicating that Eaton purchased PCB-containing oils for any purpose other than use in closed electrical equipment (transformers and capacitors).

## D. The Detection of PCBs in Grinding Swarf.

- F-71. Grinding swarf is the sludge created by the process of grinding metal parts. It consists of small particles of the metal part being ground, small particles (usually carborundum) of the grinding wheel or tool, and small quantities of the cooling fluid used in grinding.

  (Deposition: Raiche at 44-45.)
- F-72. At Eaton's Battle Creek plant, grinding swarf was deposited, through a hole in the plant's main floor, into a gondola or large trailer-sized dumpster located in the basement of the plant. (**Deposition:** Seaver at 71-72.) Outside disposal companies periodically hauled the gondola off-site. (**Deposition:** Raiche at 45.)
- F-73. In 1981, Versar tested a sample of the grinding swarf at the Battle Creek plant, and detected 7 ppm PCB of unspecified Aroclor in the swarf. (**Trial Exh. 2059:** 1981 Versar Inspection Report.)
- F-74. Versar's testing of the coolants used by Eaton in the grinding process found no PCBs, and thus eliminated the cutting and grinding oils as the source of PCBs in the swarf.

  (Trial Exh. 2059: 1981 Versar Inspection Report.)
- F-75. No evidence exists to suggest that the metal parts being ground, or the grinding tools used, contained PCBs at the Eaton Battle Creek plant.
- F-76. Plaintiff proffered, and the Court admitted, a test report from 1984, indicating the detection of 8 ppm PCB in grinding sludge or swarf from the plant. (**Trial Exh. 2072:** ATS lab report.) The only testimony provided concerning that sludge, however, came from the Eaton employee who delivered the samples to the testing lab. He had no recollection of the location from which it was taken or the circumstances under which the sludge was sampled. (**Deposition:**

Bloemer at 85-86.) The Court notes that this sampling event occurred in 1984, after the plant's operations ceased, and after the 1983 time period of wood block tests, when testimony indicates that the building was an empty shell. Demolition of the plant may have been underway; the record is not clear. (**Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 180.**)

However, it is clear that there is no testimony or evidence from which it could reasonably be inferred that the material sampled was actually attributable to Eaton's operations and process oils.

F-77. The detection of a small amount of PCBs in the grinding swarf in 1981 suggests some adulteration of the swarf gondola's contents. Eaton's Plant Engineer (later its Corporate Safety Manager), Charles Heindrichs, concluded that one likely explanation was that a plant worker, for the sake of convenience, dumped floor sweepings into the swarf dumpster. Those sweepings were generated by the floor scarifier, a large machine that ground off a small layer of the wood block floor in order to clean it. (**Deposition:** Heindrichs at 278-80.) The wood block floor contained PCBs, the source of which is in dispute; the floor sweepings scraped from those blocks would also contain PCBs.

F-78. The evidence concerning the grinding swarf, when considered in the context of the entire record, does not indicate a likelihood or probability that Eaton used PCB-containing oils. The evidence does not provide a reasonable basis for concluding that Eaton contributed measurable or detectable quantities of PCBs to the River.

#### E. What the River Shows.

F-79. The PCB testing in the River itself provides strong evidence, outweighing the contrary evidence and inferences, that Eaton's Battle Creek plant did not discharge PCBs to the Kalamazoo River.

F-80. In 1976, MDNR sampled sediments downstream of the Battle Creek plant. MDNR detected no PCBs until Morrow Pond, almost 15 miles downstream of the Battle Creek plant.

(Trial Exh. 2036: Wuycheck memo and attached 1976 sampling data, referred to as the "Wuycheck data". Trial Exh. 8928: Illustration River sampling data.)

F-81. Sediments downstream of the former Battle Creek plant, and downstream of the Battle Creek Wastewater Treatment Plant (WWTP), were sampled by the MDNR in 1988, in reviewing the permit for the WWTP. At 10 of the 11 locations sampled, no PCBs were detected. The remaining sample resulted in a single detected value of 1 ppm, taken from a point upstream of the discharge point of the Battle Creek WWTP and downstream of Eaton's Battle Creek facility. (Trial Exh. 6020: 1990 MDNR Staff Report at 1. Admission: Pltf's Response to Eaton Facts, ¶73, set out in Attachment A to these Revised Findings. Trial Exh. 8929: Chart depicting relative PCB concentrations in the River.)

F-82. The 1976 Wuycheck data is useful and illuminating because it was taken close in time to the period of discharges allegedly containing PCBs. Moreover, typically PCBs will be found in fine grain sediments, in depositional areas, near their source, if indeed such a source exists. The absence of sediment data linking PCBs in Morrow Lake to Eaton means that the Battle Creek plant did not discharge PCBs to the River. (Trial Exh. 8928: Chart depicting River sampling data. Testimony of Connolly, Aug. 14, 1998.) Dr. Connolly explained that the

findings of PCBs in settleable solids are not comparable to a finding in sediment, and are not indicative of what is in the sediment. (**Testimony of Connolly, Aug. 14, 1998.**)

F-83. Plaintiff's expert, Dr. Brown, conceded that the plaintiff has not performed any testing of the sediments upstream of Morrow Lake, to determine whether there is any connection between Eaton and the PCBs found in low levels in some locations of Morrow Lake.

(Testimony of Brown, Cross-Examination, Aug. 10, 1998, at 74-75.)

F-84. There is a fish advisory in effect for the Kalamazoo River from Battle Creek to Morrow Lake. This advisory concerns carp only, a species which Plaintiff's expert, Dr. Brown, concedes is not a human health hazard. By contrast, the fish advisory for points downstream of Morrow Lake concerns almost every species of game fish and bottom dweller. This is because the PCBs downstream of Morrow Lake are different in quantity, nature and composition from those found upstream of Morrow Lake, where Eaton's plant is located. (**Testimony of Brown**, **Cross-Examination**, Aug. 10, 1998, at 65-67.)

F-85. Plaintiff presented two experts at trial, Dr. Mark Brown and Dr. Kenneth Crumrine, concerning the alleged PCB releases by Eaton. This Court, having observed the manner and demeanor of the witnesses, and having reviewed the testimony on direct and cross examination, finds that the evidence and estimates presented by plaintiff's expert witnesses were not credible or persuasive with respect to Eaton's discharges to the River.

F-86. Dr. Brown is the project manager for the continuing investigation on behalf of the plaintiff, Kalamazoo River Study Group, and is paid by the Group. He advocates on its behalf as its spokesperson on technical matters to the State of Michigan and USEPA. He consults for a paper industry trade group, the National Council for the Paper Industry for Air and Stream

Improvement. He has advocated on behalf of paper companies to state and federal agencies regarding other PCB sites as well. He testified at trial that he has never testified against a paper company, and has never testified in favor of another entity in a case in which that entity and a paper company were facing joint and several liability at a clean-up site. (**Testimony of Brown**, **Questioning by the Court**, **Aug. 11**, **1998**, **218-220**.) His analysis, when weighed against that of Eaton's expert, is not persuasive.

F-87. Eaton's expert, Dr. John Connolly, presented persuasive and credible evidence indicating that Eaton did not contribute measurable or detectable quantities of PCBs to sediments of the River. His analysis is based upon data taken from sediments and settleable solids in the vicinity of the Eaton Battle Creek plant. (**Testimony of Connolly, Aug. 14, 1998.**)

F-88. Dr. Connolly's analysis of existing River data indicates that, among other things, the lack of PCB detections at a particular sampling point downstream of Eaton is significant. That location, Stringham Road, is an area of deposition in which sediments come to rest; PCBs in the water would settle out with the sediment in such a depositional area. If Eaton had discharged PCBs in measurable quantities, those PCBs would have been detected in the 1976 sampling done at the Stringham Road sampling location. No PCBs were detected at Stringham Road in either sediments or settleable solids, indicating that the River bottom and the water column did not contain measurable amounts of PCBs at that location. (Testimony of Connolly, Aug. 14, 1998.)

F-89. Dr. Connolly's analysis also indicates that there are sources of PCBs to the River from points upstream of Morrow Lake Dam, but that the source or sources are near Morrow Lake, not upstream in the Battle Creek region. He bases this opinion on the sediment testing of

the River that shows no detections of PCBs near Battle Creek. (Testimony of Connolly, Aug. 14, 1998.)

F-90. Dr. Connolly also testified persuasively that the sum total of all discharges of PCBs from all sources upstream of Morrow Lake is an insignificant and immeasurable contribution compared to what is in the Site. (Testimony of Connolly, Aug. 14, 1998.)

F-91. Dr. Connolly provided a confirmation that PCBs in sediments of Morrow Lake have remained there over the last 40 years. This rebuts persuasively any suggestion that sediments have been "blown out" by floods or storms affecting the River and Lake, thus sending Morrow Lake PCBs to the NPL Site, resulting in misleading low PCB levels in the Lake. Dr. Connolly performed testing in 1997 of Morrow Lake sediments at various depths. The sediments were analyzed for a form of Cesium, an element deposited by the atmospheric testing of nuclear weapons beginning in 1954. Sediments that have been slowly accumulating over the last 40 years show a pattern of no Cesium before 1954, gradually increasing amounts from 1954 to a peak of 1963, and then typically decreasing amounts again. A disruption of the sediments results in a disruption of the pattern. The sediments of Morrow Lake showed the typical pattern of pre-1954 and post-1954 Cesium levels, thus confirming for Dr. Connolly that the sediments in Morrow Lake have been accumulating and have remained virtually undisturbed since before 1954. (Testimony of Connolly, Aug. 14, 1998. Trial Exh. 8904G: Connolly Expert Report Figure A1-7 re Cesium concentrations.)

F-92. Dr. Connolly also provided an analysis of the PCBs from all sources that may have made their way past Morrow Lake Dam: he estimates that 2000 pounds of PCB may have gone past that Dam from 1950 to 1990. This is 40 pounds per year from all upstream sources:

industry, atmospheric fallout, surface water runoff. He concluded that 25 per cent, or 500 pounds, of that amount, was trapped in sediments of the Kalamazoo River. Dr. Connolly testified that there is no evidence suggesting that Eaton contributed any detectable or measurable quantity of PCBs to that 500 pounds. (**Testimony of Connolly, Aug. 14, 1998.**)

F-93. This 500 pound estimate represents 0.02 percentage of 2,200,000 pounds of PCBs in the River, the estimate given by Georgia-Pacific's expert, Richard Valley, 0.22 percent of 228,000 pounds of PCBs estimated by Mr. Creal of the MDNR, 0.14 percent of the 350,000 pounds estimated by Scott Cornelius, and about 0.42 percent of the 120,000 pounds estimated recently by plaintiff's expert, Dr. Brown.

F-94. When Dr. Connolly was asked to assume that the PCB levels measured during the February and September 1972 samplings were discharged consistently to the River, and that these discharges were attributable to Eaton (two assumptions he opined are faulty), he calculated that the mass discharges of PCBs would represent one percent of PCBs going over Morrow Lake Dam, an average of 0.51 pounds, or one-half pound, per year. Aggregated over a period of forty years, that represents a total of 20 pounds, an insignificant amount in light of the contribution of PCBs to the River by the plaintiff's member companies. (**Testimony of Connolly, Aug. 14, 1998.**)

F-95. Thus, even if Eaton discharged PCBs to the River, and at levels suggested by the flawed effluent reports from 1972, the aggregate of such discharges is minuscule in comparison to the releases made by plaintiff's member companies. Such a hypothetical discharge -- for which the record at trial provides an inadequate foundation -- does not justify the imposition of response costs upon Eaton.

#### IV. DEFENDANT ROCKWELL

F-96. Rockwell International Corporation owned property and a manufacturing plant at 1 Glass Street, Allegan. Rockwell and its predecessors operated that plant from the early 1900s until approximately 1988-89. The plant, which manufactured universal joints for the automotive industry, was located on the Kalamazoo River, downstream of the Allegan City Dam.

(Uncontroverted Facts, ¶ 28. Admission: Pltf's Response to Rockwell Facts, ¶ 22, set out in Attachment B to these Revised Findings. Trial Exh. 8914: Map depicting Rockwell Facility Location.)

F-97. The portion of the Kalamazoo River adjacent to which the former Rockwell plant sits is not within the NPL Site as defined by the Administrative Order by Consent entered into by Allied, Georgia-Pacific and Simpson. (Admission: Pltf's Response to Rockwell Facts, ¶ 23, set out in Attachment B to these Revised Findings.) Even if Rockwell were found to have released PCBs to the Kalamazoo River, plaintiff's expert quite reasonably concedes that those PCBs cannot come to be located within the NPL Site because it is <u>upstream</u> of Rockwell.

F-98. Rockwell was not an owner of riparian land within the NPL Site as defined by the AOC entered into by Allied, Georgia-Pacific and Simpson. (Uncontroverted Facts, ¶ 29. Admission: Pltf's Response to Rockwell Facts, ¶ 24, set out in Attachment B to these Revised Findings.)

F-99. Except for using certain transformers and capacitors for electrical power distribution, Rockwell never conducted any operations at the former Allegan facility of the sort in which PCBs historically were used. (**Testimony of Furlough, Aug. 12, 1998.**) This Court has previously concluded, based upon uncontradicted evidence presented in connection with the

motions for summary judgment, that Rockwell conducted no forging, die casting or other extremely high temperature operations that might have benefitted from the fire-resistant qualities of PCB-containing oil. (Opinion: KRSG v. Rockwell, et al., Case No. 1:95-CV-838, June 30, 1998, at 8.) Plaintiff presented no contradictory evidence at trial.

F-100. Plaintiff contends that PCBs were found in oils used in transformers and capacitors (electrical equipment) and in cooling and lubricating oils used in the manufacturing process (process oils). Rockwell does not dispute the contention that some of its electrical equipment used PCB-containing oil. Plaintiff presented no evidence indicating that PCB-containing oils from Rockwell's electrical equipment made their way into the Kalamazoo River from the plant.

F-101. There are no records indicating that the Rockwell plant purchased quench oils, cutting oils or hydraulic oils containing PCBs.

F-102. There is no evidence that the machining and manufacturing operations performed at the former Rockwell plant required fire-resistant additives like PCBs to the quench oils, cutting oils or hydraulic oils used in the plant.

F-103. During opening statement, in response to a question from the Court, counsel for KRSG conceded that any oils that spilled on the floor of the former Rockwell Allegan plant were incidental to the manufacturing process, because the process was one of working hard metals, not manufacturing or processing chemicals. (Opening Statement, Aug. 10, 1998.)

F-104. Beginning in the 1960s, Rockwell increasingly used water-based process oils, i.e., soluble oils. (**Deposition:** Paulson at 51.)

F-105. Water soluble oils are incompatible with PCBs because PCBs do not readily mix with water. Thus, one would not expect water soluble oil to contain PCBs. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 161-63. Testimony of Crumrine, Cross-Examination, August 13, 1998). There is a basic incompatibility between water-soluble oils and PCBs. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, 162 line 20 through 163 line 2.)

F-106. The wastewater effluent coming from the treatment ponds at Rockwell was tested by the MDNR in wastewater surveys in 1976 and 1986. Those tests found no PCBs in Rockwell's outfall to the Kalamazoo River. (**Trial Exhs. 1124 and 5025:** 1976 and 1986 Wastewater Surveys.) These results indicate that the wastewater treatment system was working effectively, although the pond sediments may have contained PCBs. (**Testimony of Barrick**, **Aug. 13/14, 1998.**)

F-107. Based on the absence of any documentary record of purchases of PCB-containing process oils, the absence of any testimony of persons having personal knowledge of use of such oils at the Rockwell plant, the non-detect sampling results of plant effluent in 1976 and 1986, and the absence of any evidence from which it could be reasonably inferred that the plant's process oils intentionally or regularly contained PCBs, this Court concludes that it is more probable than not that PCBs were not intentional or regular ingredients of the Rockwell plant's process oils. The detection of some amounts of PCBs on the Rockwell property, after the plant closed, suggests that PCBs may have been released on the property for one or more incidental reasons (dielectric leaks, unintentional and occasional contamination of oil, construction-related moving of earth contaminated at other locations). To the extent PCBs are found on the former

Rockwell property, they appear to be incidental, unintentional, and sporadic. After weighing all the evidence, the Court finds that there is insufficient basis for concluding that PCBs were an intended or regular ingredient of the process oils used at the plant. Furthermore, as explained below, the Court finds it improbable and unlikely that PCBs were released to the Kalamazoo River from the former Rockwell plant in measurable or detectable quantities.

F-108. The former Rockwell Allegan facility is a Superfund Site. USEPA investigated the Rockwell property in 1984 and detected a number of hazardous substances, like metals, but not PCBs. In 1988, based in part on EPA's findings, Rockwell entered into an AOC with the EPA to undertake a remedial investigation and feasibility study of the property.

# (Uncontroverted Facts, ¶ 33. Trial Exh. 1002: Rockwell AOC.)

F-109. Rockwell's own investigation of its property, post-AOC, found some evidence of PCBs on its property. In sporadic and limited areas of the Rockwell property, low levels of PCBs have been detected in various media on the property. The detections are consistent with low level releases of PCBs from electrical equipment which migrated to waste oil treatment areas on site or trace contamination of some oils, but are not indicative of the presence of PCBs in Rockwell's process oils from regular or consistent use of PCB-containing process oils or for any significant length of time. (**Testimony of Barrick, Aug. 13/14, 1998. Trial Exh. 8916:** Chart showing detections and non-detections of PCBs on former Rockwell property. **Trial Exh. 5054:** Historical Activities Reconstruction Report, Table 1 at back of volume. **Trial Exh. 1021:** 1998 Remedial Investigation Report for Rockwell Property, Volume 1, Tables 4-9a and 4-12c.) This remedial investigation data further confirms that the PCBs on Rockwell's property are in low concentrations, localized, and not migrating to the River. As Mr. Barrick explained, the finding

of 35 ppm off of Rockwell's property, near the riverbank south of the Oil Flotation House, is an anomaly; the detections on Rockwell's property are several orders of magnitude lower. Further, even if one were to assume this single finding was characteristic of Rockwell's discharges from the Oil Flotation House for any length of time (although there is no evidence of this), one would expect to see a difference in the chemical fingerprint of River sediments downstream as a result. This has not occurred.

F-110. Where PCBs were detected on the Rockwell property, the dominant Aroclor mixture found is Aroclor 1254. (**Testimony of Barrick, Aug. 13/14, 1998. Admission:** Pltf's Response to Rockwell Facts, ¶31, set out in Attachment B to these Revised Findings.)

F-111. When PCBs have been detected in various places in the River, Aroclor 1242 is the dominant PCB mixture. Lower molecular weight Aroclors like 1242 can "weather" in the River after leaving their source and may be reported as 1248. As a result of this phenomenon, it is more appropriate to designate the pattern as "Aroclor 1242/1248." (**Testimony of Barrick**, **Aug. 13/14, 1998.**)

- F-112. Aroclor 1242 is the dominant PCB mixture detected both upstream and downstream of the former Rockwell plant. (**Testimony of Barrick, Aug. 13/14, 1998.**)
- F-113. Aroclor 1242 is not characteristic of the PCB mixture found on the Rockwell property. (Testimony of Barrick, Aug. 13/14, 1998.)
- F-114. The dominant PCB composition detected on the Rockwell property, Aroclor 1254, is distinct from the composition of PCBs found upstream and downstream of the Rockwell plant. (Testimony of Barrick, Aug. 13/14, 1998. Trial Exhs. 8915, 8923, 8924, 8918, 8920

and 8927: Illustrative exhibits depicting PCBs sampled upstream and downstreamof Rockwell and on Rockwell property.)

F-115. If the Rockwell plant discharged PCBs in oily wastewater in detectable quantities, then the sediments immediately downstream of that plant would show increased concentrations of Aroclor 1254 from the Aroclor 1254 found on the Rockwell property. (**Testimony of Barrick**, **Aug. 13/14, 1998.**)

F-116. The composition of PCBs found downstream of the former Rockwell plant matches the composition of PCBs found upstream of the Rockwell plant, and does not match the composition of PCBs found on Rockwell property. This indicates that PCBs detected in River sediments came from releases upstream and did not migrate from the Rockwell property.

(Testimony of Barrick, Aug. 13/14, 1998. Trial Exhs. 8920, 8924, 8927: Illustrative exhibits comparing PCB gas chromatographic fingerprints.)

F-117. Aroclor 1254 is present in sediment samples taken from upstream of Rockwell, indicating that there is an upstream source of Aroclor 1254. (**Testimony of Barrick, Aug. 13/14, 1998.**)

F-118. Sediment sampling in Portage Creek, near the confluence of the Creek and the Kalamazoo River, and in nearby landfills of the plaintiff paper companies, shows the presence of Aroclors 1242 and 1254, as well as other Aroclors. (**Testimony of Barrick, Aug. 13/14, 1998. Trial Exhs. 8925, 8926, 8927:** Illustrative exhibits depicting congener analysis of PCBs found in Portage Creek and Lake Allegan.)

F-119. Aroclor 1242 was used in the manufacturing of carbonless paper; Aroclor 1254 was used in printing inks and, according to various authoritative studies, is frequently found in

paper and paper board products. (Testimony of Barrick, Aug. 13/14, 1998. Testimony of Brown, Rebuttal Cross-Examination, Aug. 17, 1998.)

F-120. If Rockwell had released PCBs to the River, those PCBs (composed of Aroclor 1254) would have increased the ratio of Aroclor 1254 to Aroclor 1242 (the dominant Aroclor) in sediments downstream of Rockwell. In sediment samples taken upstream of Rockwell and downstream of Rockwell, a comparison of the gas chromatographic "fingerprints" indicates that the ratio of Aroclor 1242 to Aroclor 1254 is relatively constant, indicating again that there was no measurable, independent release of PCBs from the Rockwell plant. (Testimony of Barrick, Aug. 13/14, 1998. Trial Exhs. 8919, 8920, 8927: Illustrative charts comparing PCB fingerprints.)

F-121. In addition to a consistent ratio of Aroclor 1242 to 1254 both upstream and downstream of Rockwell, there is no increase in the overall concentration of PCBs immediately downstream of Rockwell, which would be an indication that an additional source of PCBs was present. (**Testimony of Barrick, Aug. 13/14, 1998.**) The absence of an increase constitutes credible and persuasive evidence that the former Rockwell Allegan facility is not a source of PCBs to the Kalamazoo River.

F-122. The deinking operations of plaintiff's paper recycling mills, not Rockwell's operations, were likely sources of Aroclor 1254 as well as of Aroclor 1242 found in River sediments. (**Testimony of Barrick, Aug. 13/14, 1998.**)

F-123. Plaintiff presented no expert testimony to contradict the opinions of Mr. Barrick concerning the gas chromatograph or "fingerprint" analysis performed by him of PCBs in the Site. The fingerprint analysis is reliable, and Mr. Barrick's testimony concerning his findings is

credible and persuasive. Fingerprint analysis has been relied upon by other courts. see Anglado v. Leaf River Forest Prods, Inc., 1998 WL 286610 (Miss. S. Ct. 1998), and is, in this instance, supported by sound expert testimony, foundation and interpretation.

F-124. In light of the analysis by Mr. Barrick concerning the ratio of Aroclor 1242 to 1254, several admissions by plaintiff's expert, Dr. Brown, are significant. Dr. Brown conceded that Aroclors 1254 and 1260 have been detected in residuals from the paper companies' facilities. He also conceded that levels of Aroclor 1254 have been detected in fish caught in Portage Creek. and that those levels are significantly higher than the levels of 1254 in those caught in Morrow Lake. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 150-53.) Aroclor 1254 and 1260 were detected in fish caught in the River near the Simpson-Plainwell facility location, and the concentrations of 1254 found in those downstream fish were "considerably higher," about ten times higher, than the concentrations in Morrow Lake fish. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 153-54.) These disparities in concentration between Morrow Lake fish and downstream fish further support the conclusion that the most significant sources of PCBs to the River, including Aroclors 1254 and 1260, begin in the vicinity of plaintiff's members' mills. They also support the analysis of Mr. Barrick in interpreting the ratio between Aroclors 1254 and 1242 in the River upstream and downstream of the former Rockwell facility, and support the conclusion of Dr. Connolly that, although there may be sources of PCBs into Morrow Lake, those amounts are insignificant when compared to the massive amounts of PCBs further downstream where the paper companies are located.

- F-125. Dr. Kenneth Crumrine, an expert presented at trial by plaintiff, did not present credible and persuasive evidence concerning a release of PCBs by Rockwell. Several factors lead this Court to reject his testimony:
  - 1. Dr. Crumrine could not accurately define PCBs as a chemical compound;
  - 2. He could not correctly recall the highest concentration of PCBs in soil on the Rockwell property;
  - 3. He was unable to quantify the PCBs that allegedly left Rockwell;
  - 4. His use of a 1965 wastewater treatment survey, Trial Exhibit 1064, was disingenuous. He deliberately chose from the survey the value of 270 gallons of oil per day of discharge from the oil flotation house as his basis for calculating yearly flows (and thus, by inference, the volume of PCBs reaching the River), despite the fact that the same survey showed only a five-gallon discharge of oil the next day;
  - 5. The absence, in the testimony of Rockwell witnesses and in the Rockwell documents, of any evidence of PCB use in process oils at the facility therefore left Dr. Crumrine's testimony without foundation:
  - 6. His impeachment by an affidavit tendered in 1983 related to litigation involving Outboard Marine Corporation, swearing under oath that PCB detections in wastewater and groundwater below 1.0 ppb during the 1983 time period were unreliable, based on technology limitations. Dr. Crumrine now holds the opposite opinion with regard to a 1972 detection of less than 1.0 ppb PCB in a stormwater drain from Eaton's plant.
  - 7. His overreaching calculation of PCBs discharged by Eaton's Battle Creek Plant, which was wholly without foundation.

# (Testimony of Crumrine, Cross-Examination, Aug. 13, 1998.)

F-126. If the Rockwell Allegan plant had not been located on the River, the nature, composition, concentration and dispersion of PCBs in the River would be exactly the same as it appears to be today, and the same remedial action would be required. This Court concludes that there was no release of measurable and detectable quantities of PCBs from the Rockwell Allegan plant and that there was, therefore, no "release" of PCBs for purposes of CERCLA.

F-127. This Court has weighed the evidence, has found Mr. Barrick's expert opinion, evidence, analysis and interpretation to be credible and persuasive, and has rejected the opinions of Dr. Crumrine as unpersuasive and not credible. This Court concludes that it is not probable or likely that the former Rockwell Allegan plant released PCBs to the Kalamazoo River in any measurable or detectable quantity.

#### V. LIABILITY OF DEFENDANTS EATON AND ROCKWELL

- L-5. In order to establish a prima facie case of Section 113 CERCLA liability against one or more defendants, plaintiff must establish that:
  - a. there was a release or threatened release of a hazardous substance:
  - b. the Site of the release of threatened release is a "facility" as defined in 42 U.S.C. § 9601(9);
  - c. the release or threatened release has caused the plaintiff to incur response costs; and
  - d. the defendant is an owner or operator of the facility from which there was a release, or is an arranger or transporter under CERCLA § 107(a).

42 U.S.C. § 9607(a). See also Amoco Oil Co. v. Borden, Inc., 889 F.2d 664, 668 (5th Cir. 1989);

Plaskon Elec. Mat'ls Inc. v. Allied-Signal, Inc., 904 F. Supp. 644, 659 (N.D. Ohio 1995);

Opinion: KRSG v. Rockwell, et al., Case No. 1:95-CV-838, Mar. 6, 1998, at 6-7.

- L-6. In addition to the elements of a prima facie case, in order to hold one or more defendants liable, plaintiff must prove that hazardous substances traceable to the defendant are in nature, quantity and durability sufficient to satisfy a minimum standard of significance of that defendant's responsibility as a source of the hazardous substance at the site. This requires more than a *de minimis* or scintilla standard. **Opinion:** KRSG v. Rockwell, et al., Case No. 1:95-CV-838, Mar. 6, 1998, at 14-15.
- L-7. NREPA, M.C.L.A. § 324.20101 et seq. (formerly "MERA," the Michigan Environmental Response Act), was patterned after CERCLA, and is construed in accordance with CERCLA. Kelley v. Tiscornia, 827 F. Supp. 1315, 1318 n. 1 (W.D. Mich. 1993); Flanders

- Indus., Inc. v. Michigan, 203 Mich. App. 15, 21; 512 N.W.2d 328 (1993); **Opinion:** KRSG v. Rockwell, et al., Case No. 1:95-CV-838, Mar. 6, 1998, at 7.
- L-8. Plaintiff's claims under Part 201 of NREPA will stand or fall under the same analysis applied to the claims under CERCLA. **Opinion:** <u>KRSG v. Rockwell, et al.</u>, Case No. 1:95-CV-838, Mar. 6, 1998, at 7.
- L-9. This Court is not bound by the regulations of the State of Michigan concerning acceptable levels of PCBs. The Court notes that the State of Michigan apparently utilizes a standard that is far below detection limits currently available for PCB detection.
- L-10. Of the two effluent samples to which plaintiff points as evidence of PCB releases from Eaton Corporation's Battle Creek plant, one was from a joint outfall, and is not competent evidence attributable to Eaton. There remains, therefore, a single test showing the detection of PCBs, and that test yielded a level of PCBs near the detection limit. A single, unrepeatable test has been rejected as the basis for a finding of chronic discharge of contaminants. In <u>Textron Inc. v. Barber-Colman Co.</u>, 903 F. Supp. 1546, 1552 (W.D.N.C. 1995), the district court granted summary judgment to the defendant because plaintiff could not produce evidence that the single test result upon which it was relying was typical of what the defendant was discharging:

As a result, [plaintiff's] claim rests ultimately on the test results from 1974, but absent evidence indicating those results are typical, they are not significantly probative. . . . [O]ne test is not a sufficient basis for extrapolation absent additional evidence which establishes that those results are a reliable indicator of typical discharges.

Id. at 1555. A district court in Colorado has similarly rejected a single test result as a basis for plaintiff's claim:

It is unsound scientific practice to select one concentration measured at a single location and point in time and apply it to describe continuous releases of contamination over an 11-year period.

Renaud v. Martin Marietta Corp., 749 F. Supp. 1545, 1553 (D. Colo. 1990), aff'd, 972 F.2d 304 (10th Cir. 1992). That trial court's conclusion on this point was expressly approved on appeal:

We agree, ourselves observing that this would seem little more than common sense . . . .

Renaud v. Martin Marietta Corp., 972 F.2d 304, 308 (10th Cir. 1992).

- L-11. Science, as well as law, requires that a single test result be rejected as a reliable basis for a conclusion. "In science, *reliability* refers to reproducibility of results." D. Kaye and D. Freedman, "Reference Guide on Statistics." Reference Manual on Scientific Evidence, Federal Judicial Center, at 341 (emphasis in original). "In a case involving scientific evidence, evidentiary reliability will be based upon scientific validity." <u>Daubert, supra</u>, 113 S. Ct. at 2795 n.9. This Court concludes, therefore, that even if the September 1972 effluent detections were reliable in themselves (something which Eaton's expert Dr. Connolly rejects and which plaintiff's expert Dr. Crumrine rejected in other litigation, although he now takes the opposite view), they do not provide competent evidence upon which to base a conclusion about the quality of the Battle Creek plant's effluent on a long-term basis.
- L-12. There is no evidence from which to conclude reasonably that any measurable or detectable quantity of PCBs were contributed by Eaton's Battle Creek plant to the NPL Site, the Kalamazoo River or Portage Creek.

- L-13. In the alternative, even if Eaton did contribute a measurable or detectable quantity of PCBs to the NPL Site, the River or the Creek, the contribution is not of sufficient quantity to justify imposing the costs of response activities for the NPL Site upon Eaton.
- L-14. If Eaton did contribute a measurable or detectable quantity of PCBs to the NPL Site, the River or the Creek, the contributions are, in nature, quantity and durability, not sufficient to require imposing the costs of response activities for the NPL Site upon Eaton.
- L-15. Eaton is not liable to plaintiff or any of its members under Section 113 of CERCLA, 42 U.S.C. § 9613, for the PCB contamination of the River, the Creek or the NPL Site.
- L-16. There is no basis for concluding that Rockwell's former Allegan plant contributed any PCBs to the NPL Site, because the NPL Site is upstream of the Rockwell facility.
- L-17. There is no competent evidence from which to conclude reasonably that any measurable or detectable quantity of PCBs were contributed by Rockwell's former Allegan plant to the Kalamazoo River.
- L-18. In the alternative, even if Rockwell's former Allegan plant did contribute a measurable or detectable quantity of PCBs to the River, the contribution is not of sufficient quantity to justify imposing the costs of response activities for the NPL Site upon Rockwell.
- L-19. If Rockwell's former Allegan facility did contribute a measurable or detectable quantity of PCBs to the River, the contributions are, in nature, quantity and durability, not sufficient to require imposing the costs of response activities for the NPL Site upon Rockwell.
- L-20. Rockwell is not liable to plaintiff or any of its members under Section 113 of CERCLA, 42 U.S.C. § 9613, for the PCB contamination of the River or NPL Site.

L-21. Judgment shall be entered in accordance with Fed. R. Civ. P. 58 in favor of defendants Eaton Corporation and Rockwell International Corporation, and against plaintiff, on the claims of the Restated First Amended Complaint.

#### VI. PLAINTIFF'S MEMBER COMPANIES

F-128. Each of the mills owned by KRSG's members performed deinking or used deinked feedstock at some point in the past. (**Opinion:** KRSG v. Rockwell, et al, Case No. 1:95-CV-838, Mar. 6, 1998, at 3.)

F-129. Each of the Plaintiff's members utilized carbonless copy paper as a component in their recycled furnish (also known as feedstock). (**Depositions:** Hanson at 27-30 (Georgia-Pacific); Gilman at 29-31, 107-108 (Allied); Huisman at 24 (James River); Lawton at 72-75 (Simpson). **Trial Exh. 8012, 8013:** Brown Company memoranda.) Georgia-Pacific and James - River, at various times, used feedstock consisting entirely or largely of NCR paper. (**Opinion:** KRSG v. Rockwell, et al, Case No. 1:95-CV-838, Mar. 6, 1998, at 3.)

F-130. PCBs from plaintiff's members' mills have been detected in their residual sludges and in their effluent. (Admission: Pltf's Response to Rockwell Facts, ¶11, set out in Attachment B to these Revised Findings.)

F-131. An expert retained by Georgia-Pacific Corporation, Richard Valley, prepared a report in 1990, estimating amounts of PCBs discharged by the paper mills during the period from 1960 to 1979. According to the Valley Report, Allied discharged between 895,000 and 1,790,000 pounds of PCBs to the NPL Site, Georgia-Pacific discharged between 560,000 and 1,120,000 pounds, James River discharged between 512,000 and 1,025,000 pounds from one of its three facilities, and Simpson discharged between 254,000 and 507,000 pounds of PCBs to the NPL Site. (**Trial Exh. 8804:** Valley Report at KB203-00497 to -00498.)

F-132. KRSG's expert, Dr. Brown, conceded that there were substantial quantities of PCBs in the River attributable to KRSG's members. Although it is not surprising that his

estimate is more conservative than those of the MDEQ or Richard Valley, Dr. Brown recently calculated the volume of PCBs to be approximately 120,000 pounds in the riverbed from Portage Creek downstream. He also admitted that, taking into account the roughness of the estimate, the range of volume of PCBs could be from 60,000 to perhaps 240,000 pounds. (**Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 107-108.**) Dr. Brown's estimate does not include the nearly three million cubic yards of PCBs present in KRSG's residuals in landfills and historical lagoons, many of which are a continuing source of new PCBs to the River and Creek. (**Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 108-109.**)

F-133. The evidence presented at trial (in the form of deposition testimony, documents compiled by plaintiff's environmental consultant Blasland Bouck & Lee, expert testimony of defendants' expert Mr. Barrick, and evidence adduced from plaintiff's expert Dr. Mark Brown on cross-examination) supports in a credible and persuasive way the conclusion that plaintiff's member companies contributed massive amounts of PCBs to the NPL Site, the Kalamazoo River and Portage Creek. Plaintiff's principal expert, Dr. Mark Brown, conceded that the Michigan Department of Environmental Quality has found that the PCB contamination in the Site comes from the paper industry. He conceded that it is likely that most of the Aroclor 1242 found in the River came from the paper recycling industry. (Testimony of Brown, Cross-Examination, Aug. 10, 1998, at 91-92.) He also conceded that plaintiff's residuals (i.e., the PCBs containing waste in the operable units, some of which continues to erode and leak into the River today) is in excess of one million cubic yards, and "probably a little less than" three million cubic yards. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 109.) As Dr. Brown told a

citizens group several years ago, the residuals alone would fill the Pontiac Silverdome 1½ times. (Testimony of Brown, id.)

F-134. Plaintiff presented no persuasive or credible evidence contradicting the conclusion that the KRSG is responsible for releasing massive quantities of PCBs to the Site.

F-135. USEPA has concluded, after investigation, that Allied's Bryant Mill Pond is the most important upstream source of PCBs to the River. (**Trial Exh. 8813:** USEPA Addendum to Action Memorandum.)

F-136. Based on the records and testimony available today, it appears that James River is the only member of plaintiff that consistently and systematically tested for PCBs in its product, waste and effluent.

F-137. Of the four KRSG members, Allied Paper was the largest manufacturer.

(Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 136-37.) Allied and Georgia-Pacific conducted deinking and paper recycling operations on an even larger scale than did James River, but these companies did not consistently test for PCBs. (Trial Exh. 8235: Allied Paper Omnibus.)

F-138. Based on the presence of elevated concentrations of PCBs in the paper residuals removed from the clarifiers of Allied, Georgia-Pacific, James River and Simpson and disposed of in landfills within the NPL Site, it can be reasonably inferred that the corresponding effluent from those KRSG members' clarifiers contained PCBs attached to suspended solids within that effluent, which was discharged to the Kalamazoo River and Portage Creek. This is evidenced, for example, by a comparison of PCB levels in clarifier influent, effluent and paper residuals (vacuum filter solids) from the Brown (James River) Company clarifier. (**Testimony of** 

Barrick, Aug. 13/14, 1998. Trial Exhs. 8008, 8015, and 8016: Brown Co. lab reports. comparing PCB levels in clarifier influent, effluent and paper residuals (vacuum filter solids).

F-139. Plaintiff's expert agreed at trial that a variety of Aroclors, not just Aroclor 1242, was detected in the residuals of at least three of the four paper companies. Those Aroclors include 1016, 1242, 1248, 1254, and 1260. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 120 (Allied), 128, 130-31, 133-34 (Georgia-Pacific), 132 (Simpson).) Testing by MDNR in 1987 of the fourth company disclosed Aroclors 1248 and 1254 in the company's landfill residuals, and Aroclors 1242 and 1254 in its outfall to the Kalamazoo River. (Trial Exh: 8023: MDNR Letter re James River sampling results.)

# A. James River Paper Company

F-140. James River Corporation and its predecessors (KVP Sutherland and Brown Company) have operated two paper-making facilities along the Kalamazoo River since 1939.

One is the Specialty Papers Division located in Parchment, Michigan ("Parchment Mill"). The second is a box board manufacturing plant in Kalamazoo ("Kalamazoo Mill"). The Kalamazoo Mill also operated a deinking facility for a period of years during the 1970s. (Uncontroverted Facts, ¶13. Deposition: Ferguson at 14-16; Nitz at 38-39.)

F-141. The Parchment Mill comprised two paper mills, plus a parchmentizing operation.

(Uncontroverted Facts, ¶ 14. Trial Exh 8001: 1973 MDNR Industrial Waste Survey of James River, at 2.)

F-142. Wastewater from the Parchment Mill is discharged to the Kalamazoo River.

From 1939 through the mid 1970's, all effluent from Mill No. 1 operations at the Parchment Mill

was discharged directly to the Kalamazoo River without waste treatment. (**Trial Exh. 8000**: 1972 James River interoffice memo.)

F-143. Prior to the mid 1970's, Parchment Mill No. 2 wastewater was discharged to the Kalamazoo River through a river weir after passing through a series of settling lagoons. A clarifier and sludge dewatering system was implemented at the Parchment Mill in the mid to late 1970's. (**Deposition:** Ferguson at 18.)

F-144. The Kalamazoo Mill box board manufacturing plant used pulp made of 100% recycled waste paper as furnish in its operations (**Deposition:** Ferguson at 14-16).

F-145. For a period of years in the mid 1970's, the Kalamazoo Mill operated a deinking mill ("pulp mill") which supplied de-inked pulp for use at the Parchment Mill. (**Deposition:** Ferguson at 14-16; Chadderdon at 14-15.) The pulp mill used primarily office waste paper, which contained NCR paper, as furnish for its operations. (**Deposition:** Nitz at 38-39). A James River document indicates that, on at least two particular days, 100% of the furnish for James River's pulp mill was NCR paper. (**Trial Exh. 8007:** 1976 lab reports re James River effluent, at page KJ 01000022.)

F-146. Prior to the late 1960's, treated wastewater from the Kalamazoo Facility was discharged to the Kalamazoo River. After the late 1960's effluent from the Kalamazoo Mill was discharged to the Kalamazoo Water Reclamation Plant. (**Deposition:** Zinkus at 19)

F-147. Beginning in the early 1970's, as a requirement of the U.S. Food and Drug Administration, James River began testing for PCB levels in its box board used for food packaging manufactured at the Kalamazoo Mill. James River performed daily PCB testing in its

own laboratory using a gas chromatograph and a full time staff trained to perform PCB analysis. (**Deposition:** Huisman at 13, 16.)

F-148. According to Dr. Huisman, director of James River's laboratory, PCBs were detected in nearly every sample taken of James River's box board during the early 1970s to mid-1970s. (**Depositions:** Huisman at 21-22; Nitz at 30-32. **Trial Exh. 8022:** 1981 letter attaching PCB data.)

F-149. Beginning in the mid-1970's, James River tested for and confirmed the existence of PCBs in its (1) paper residuals from both the Kalamazoo and Parchment Mills (**Trial Exh.** 8015: 1976 lab report. **Trial Exh. 8016:** 1976 lab report. **Trial Exh. 8020:** 1979 letter. **Trial Exh. 8018:** 1977 memorandum); (2) pulp from the deinking mill (**Trial Exh. 8003:** 1975 lab reports. **Trial Exh. 8009:** 1976 lab report); (3) waste paper furnish used in box board production and the deinking mill (**Trial Exhs. 8012, 8013:** 1976 memoranda and lab reports); and (4) effluent to the Kalamazoo River at its Parchment Mill outfall (**Trial Exh. 8004:** 1975 and 1976 lab reports) and to the Kalamazoo Water Reclamation Plant from the Kalamazoo Mill (**Trial Exh. 8005:** 1975 and 1976 lab reports.)

F-150. In 1976, James River conducted a study to determine PCB concentrations in samples of white and colored ledger waste paper used as furnish in its deinking mill. Of the 24 samples taken, each contained PCBs, with levels as high as 9,605 ppm. (**Trial Exhs. 8012**, **8013**: 1976 memoranda and lab reports.)

F-151. Frank Yankoviak, James River's Technical Director, stated in a memorandum describing the study of furnish for the mills: "These results indicate that there is a considerable

amount of PCB's coming in through our waste paper furnish." (**Trial Exh. 8013:** 1976 memorandum at page KJ 00900020.)

F-152. PCBs were detected in James River's paper residuals (vacuum filter solids) at levels ranging between 12.7 and 125.7 ppm. (**Trial Exh. 8015**: 1976 lab report at page KJ 01000046-48; **Trial Exh. 8016**: 1976 lab report. **Trial Exh. 8018**: 1977 memorandum. **Deposition:** Huisman at 99-101, 122-24.) The paper residuals from both the Kalamazoo Mill and the Parchment Mill were deposited in James River's landfill at the Parchment Mill located near the Kalamazoo River. In 1987, the MDNR detected PCBs in soil/sludge samples from James River's landfill. (**Trial Exh. 8023**: 1987 letter, MDNR to James River. attaching PCB sampling data.)

F-153. PCBs were detected in the pulp generated at James River's deinking mill at levels ranging from a trace up to 110 ppm. (**Trial Exh. 8009:** 1976 lab report. **Deposition:** Huisman at 53-67, 43-49, 102-106). Pulp from the deinking mill in Kalamazoo was used in James River's Parchment Mill. (**Depositions:** Ferguson at 14-16; Huisman at 54.)

F-154. On several occasions in 1975 and 1976, PCBs were detected in the James River Parchment Mill's effluent to the Kalamazoo River, measured at the river weir, at levels ranging from less than .1 up to 102.8 ppb. (**Trial Exh. 8004:** 1975 and 1976 lab reports. **Trial Exh. 8006:** Compilation of Brown Co. PCB data, including effluent data. **Deposition:** Huisman at 72-77.)

F-155. On several occasions in 1975 and 1976, PCBs were detected in the effluent from the James River Kalamazoo Mill to the City water reclamation plant, at levels ranging from less than 0.1 ppb up to 33.3 ppb. (**Trial Exh. 8005, 8008, 8011, 8010. Deposition:** Huisman at 54.)

The City discharged its effluent to the River after an additional settling process, which was the only treatment used to remove PCBs from the City's effluent.

F-156. Between 1975 and 1985, James River's engineering staff compiled a series of PCB test results documenting the high levels of PCBs in James River's production of paper products, paper residuals, pulp and effluent discharges. **Trial Exh. 8006:** compilation of PCB data. **Deposition:** Zinkus at 170-75.)

#### B. Allied Paper Company, Inc.

F-157. Allied operated three mills within the NPL Site: Bryant Mill, Monarch Mill and King Mill. These mills practiced deinking from the 1950s through 1971. (Uncontroverted Facts, ¶ 15. Trial Exh. 8715: Blasland, Bouck & Lee, Tech. Memo No. 15, p. 1-1. Admission:

Pltf's Response to Rockwell Facts, ¶6, set out in Attachment B to these Revised Findings.)

F-158. Annual reports and other documents recounting Allied's history state that Allied's Kalamazoo facilities ran the world's largest deinking operation. (**Trial Exh. 8236:** Allied Paper Omnibus at page KA 04600438. **Deposition:** Falvey at 91). Deinking occurred at the King Mill from at least the 1940's until 1960. The Bryant Mill practiced deinking from 1957 through 1971 and the Monarch Mill from the 1940's until 1960. (**Trial Exh. 8715:** BBL Tech. Memo No. 15, Mill Investigation at 1-3 to 1-6.)

F-159. Beginning in 1953, the Monarch clarifier effluent was discharged to Portage Creek upstream of Bryant Mill Pond. (**Deposition:** Falvey at 11). Beginning in the mid-1950's, the Bryant clarifier was also discharged to Portage Creek upstream of Bryant Mill Pond, but in the early 1970's was rerouted to the City's treatment plant. (**Deposition:** Falvey at 39-40, 42-43). Throughout its operation, the King clarifier effluent was discharged to the Kalamazoo River through the King Highway storm sewer. (**Deposition:** Falvey at 27-30).

F-160. A December 31, 1958, Allied interoffice memorandum states with regard to the King Mill waste treatment system:

"We are in flagrant violation of our Michigan Water Resources Commission Orders on the amount of waste that we may discharge into the Kalamazoo River. Presently and for some time now, we have done little or no effective settling of our mill wastes. The system has been in operation with the only thing happening being power usage."

With regard to the Bryant Mill, the same memorandum stated: "the main problem in operation [of the system] is the periodic bypassing of the highly loaded deinking waste directly to Portage Creek." (**Trial Exh. 8204:** 1958 Allied interoffice memo.)

F-161. An April 25, 1958, Allied interoffice memorandum states:

"The King settling tank during the past year (1957-58) has been down from 13-20% of the operating days due to mechanical and operational trouble. During the 313 operating days, the mill effluent was not treated 31 days due to sludge pump trouble. For 30 days (for a few hours to 24 hours) the system was down due to repair and unclogging of the continuous bar grate cleaner."

(Trial Exh. 8203: 1958 interoffice memorandum.)

F-162. Allied waste treatment system performance data states that in 1961, Allied discharged 156,494 pounds per day of suspended solids to the Kalamazoo River and 53,494 pounds per day of suspended solids to Portage Creek. (**Trial Exh. 8232:** chart of suspended solids.) This data only reflects discharges from the clarifiers. Suspended solids in waste waters that were bypassed directly to Portage Creek or the Kalamazoo River are not included in this data.

F-163. During the entire time that deinking occurred at Allied, and afterward, Allied experienced periodic breakdowns and other problems with operation of its various waste treatment systems. Periodic bypasses of untreated waste from deinking operations occurred at each of the mills. Periodically, from the 1950's through the 1970's, MDNR staff and other witnesses observed bypasses of untreated wastes into Portage Creek and Bryant Mill Pond and

observed the Pond itself to be a milky white color. (**Trial Exhs. 8222, 8202, 8214, 8209, 8208, 8207, 8205.**)

F-164. Allied has not produced any PCB test results of effluent prior to 1971, the time period when deinking or recycling of waste paper was occurring in the Allied Mills.

F-165. In 1973, after deinking and waste paper recycling activities had ceased, the MDNR detected PCBs at a concentration of 6.9 ppb in the Bryant clarifier's effluent discharged to the City's treatment plant. (**Trial Exh. 8213:** 1973 letter, MDNR to Allied.)

F-166. PCBs were detected in Allied's Monarch clarifier discharge to Portage Creek in 1985 and 1986. (**Trial Exh. 8225:** 1987 table of PCB results.)

F-167. Allied stated in an information sheet issued to its employees, which discussed the PCB contamination in Bryant Mill Pond: "The deinking process produced waste. Unknown to Allied, at times that waste contained PCB traces from the dyes used in making carbonless copy paper. Allied sent that waste through its own in-plant wastewater treatment system, which consisted of clarifiers, or large settling tanks . . . . The only known source of PCBs in the effluent stream -- some of which escaped the clarifiers and were discharged into Portage Creek -- were the carbonless paper dyes, and perhaps a small amount from PCBs in printing inks." (**Trial Exh. 8224:** 1987 cover letter and "Backgrounder.")

F-168. Remedial Investigation data generated or gathered by plaintiff KRSG's environmental consultants shows that, in 74 surficial samples throughout the Bryant Mill Pond, the average PCB concentration is 110 ppm. In 222 subsurface samples in the pond sediments, the average PCB concentration is 63 ppm. (**Trial Exh. 8719:** Draft BBL Tech. Memo No. 7,

Allied Paper, Inc. Operable Unit, at 35. Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 117-119.)

F-169. A known release of PCBs from Bryant Mill Pond occurred in 1976 when Allied lowered the pond and the impounded water and its sediment load were permitted to escape over the dam and downstream into the Kalamazoo River. Over a three week period, Portage Creek turned a gray-black color from pond sediments that were churned up and transported over the dam during the lowering process. During this time period, Portage Creek water samples showed PCB levels ranging between 92.7 to 292 ppb in the water traveling over the Alcott Street Dam toward the Kalamazoo River. (Trial Exh. 8216: Letter, Allied to MDNR, at page SA 006771.

Testimony of Brown, Cross-Examination, Aug. 11, 1998 at 122.)

F-170. When the Bryant Mill Pond was lowered in 1976, the presence of paper residuals was evident and the pond bottom was gray in color. (**Depositions:** Falvey at 135; Harvey at 133; Brooks at 97-98; Cornelius at 36-37.)

F-171. Because of the continuing risk to human health and the environment, USEPA plans to complete a time-critical removal action in situ to remove 85,000 cubic yards of PCB contaminated Bryant Mill Pond sediments within Portage Creek, which are a continuing source of PCB contamination to the remainder of the Site. (**Trial Exhs. 8812 and 8813:** USEPA Action Memorandum and Addendum re Removal Action.)

F-172. Over one million cubic yards of PCB-contaminated paper sludge are present in various disposal areas and historical sludge de-watering lagoons of the 51-acre Allied OU, located in an area adjacent to Portage Creek. (**Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 114.**) Paper residuals in the (1) Bryant and Monarch Mill residual de-watering

lagoons, (2) Type III paper sludge landfill, (3) western disposal area, and (4) Portage Creek floodplain and sediments contain varying levels of PCBs. (**Trial Exh. 8719:** Draft BBL Tech. Memo No. 7, Allied Paper Operable Unit, at 59. **Deposition:** Cornelius at 36-37, 81.)

F-173. PCB concentrations in Allied's Type III landfill were as high as 2000 ppm.

(Trial Exh. 8719: Draft BBL Tech. Memo No. 7, Allied Paper Operable Unit, at 34.

Deposition: Cornelius at 74.)

F-174. PCB releases to the NPL Site have been confirmed in leachate seeps and surface water drainage within Allied's sludge disposal areas. (**Trial Exh. 8027 / 8233:** "Results of Allied Paper, Inc. Program to Monitor PCBs in the Isolated Flow Areas." **Trial Exh. 8218:** 1976 MDNR Industrial Waste Water Survey. **Deposition:** Cornelius at 97-98.)

F-175. Remedial Investigation data shows that in addition to Aroclor 1242, Aroclors 1016, 1248, 1254 and 1260 are also present in paper residuals in the various disposal areas located about the Allied Operable Unit. (**Trial Exh. 8719:** Draft BBL Tech. Memo No. 7, Allied Paper, Inc. Operable Unit, Table 3-10. **Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 120-21. Deposition:** Cornelius at 84-86.)

F-176. In addition to releases of PCBs caused by deinking operations, there is evidence of PCB releases from other sources at Allied. During an inspection by USEPA contractors in 1981, PCB-containing transformers were found to be leaking at the Allied facilities. As a result, Allied paid civil penalties for violations of the Toxic Substance Control Act. (**Trial Exh. 8220:** 1981 Versar Report on PCB Inspection of Allied's facility. **Trial Exh. 8221:** 1982 EPA Complaint re same.)

#### C. Georgia-Pacific

F-177. Georgia-Pacific's mill in Kalamazoo, located on King Highway, practiced deinking from the 1950s to the present. (**Trial Exh. 8715:** BBL Tech. Memo No. 15, p. 1-1. (**Admission:** Pltf's Response to Rockwell Facts, ¶7, set out in Attachment B to these Revised Findings.)

F-178. The Valley Report, which was commissioned by Georgia-Pacific, states that, based on company records, Georgia-Pacific de-inked up to 200 tons of waste paper per day.

Georgia-Pacific ranked behind only Allied Paper in terms of the size of its deinking operations in the Kalamazoo River Valley. (**Trial Exh 8804:** Valley Report)

F-179. Carbonless copy paper was used in Georgia-Pacific's deinking operations, and bales of NCR paper were required in the formula for the de-inked and recycled pulp used for paper making. (**Deposition:** Hanson at 27-30.)

F-180. In 1954, a primary treatment clarifier was installed at the Georgia-Pacific Mill, which discharged waste water to the Kalamazoo River for 10 years until 1964. After this time, the effluent from Georgia Pacific's clarifier was sent to the Kalamazoo Waste Water Treatment Plant. (**Trial Exh. 8715:** BBL Tech. Memo 15, Mill Investigation, at 1-1 and 1-2.)

F-181. During most of the 1950's, Georgia-Pacific's paper residuals were pumped from the clarifier to adjacent sludge de-watering lagoons located along the River. In the late 1950's, the King Highway de-watering lagoons were constructed on the opposite side of the Kalamazoo River and paper sludge, at two to four percent solids, was pumped across the river via pipeline for de-watering in the unlined lagoons. (**Trial Exh. 8715:** BBL Tech. Memo 15, Mill Investigation, at 1-1 and 1-2.)

F-182. Paper sludge was periodically excavated from the de-watering lagoons and disposed of at the Willow Boulevard landfill until 1975, when the landfill reached capacity. From 1975 to 1987, the paper sludge was disposed of at the landfill known as the Willow Boulevard/A-Site (an area formerly operated by Allied as de-watering lagoons). After this time, sludges were disposed of at the King Highway Landfill, a landfill created over the top of the old Georgia-Pacific de-watering lagoons. (**Trial Exh. 8715:** BBL Tech. Memo 15, Mill Investigation, at 1-1 and 1-2.)

F-183. The Willow Boulevard/A-Site is a landfill owned and formerly operated by Georgia-Pacific located on the banks of the Kalamazoo River. The A-Site was previously a series of sludge dewatering lagoons used by Allied's King Mill before being covered over by Georgia- Pacific's paper residuals. There is no visible berm or storm water collection system at the Willow Boulevard Landfill. PCB-contaminated paper residuals have been identified in areas throughout the landfill and are present in the Kalamazoo River adjacent to the Landfill. PCB-contaminated paper residuals are present along the east and west banks of Davis Creek, which forms the boundary on the east side of the A-Site. Davis Creek flows into the Kalamazoo River. Another intermittent stream containing paper residuals bisects the Willow Boulevard Site from the A-Site and ultimately flows into the Kalamazoo River. (Trial Exh. 8738: BBL Tech. Memo 9, Willow Boulevard/A-Site Operable Unit. Deposition: Cornelius at 26-29, 102-114.)

F-184. The King Highway Landfill, located along the Kalamazoo River, is owned and operated by Georgia-Pacific. Underlying this landfill are sludge dewatering lagoons formerly utilized by Georgia-Pacific in earlier years. PCB-contaminated sludges have been identified in areas throughout the landfill. PCB-contaminated paper residuals are located in the King

Highway storm sewer on the west boundary of the landfill, and extend into the Kalamazoo River. Evidence indicates that these PCB-contaminated residuals in the river originated from Allied's King Mill which utilized the storm sewer for its waste water discharges. (**Trial Exh. 8715:** BBL Tech. Memo 15, Mill Investigation, at 2-5. **Trial Exh. 8725:** BBL Tech. Memo 6, King Highway Landfill Operable Unit, at 29 through 31, Table 3-9.) Over 1000 cubic yards of PCB-contaminated paper residuals were located in the Kalamazoo River in the vicinity of the King Highway storm sewer until being excavated recently. (**Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 129-30.**)

F-185. In 1996, an investigation of the presence of PCBs was conducted at the Georgia-Pacific Mill. PCB concentrations up to 110 ppm were detected in the former lagoon areas next to the old Georgia-Pacific clarifier. The Aroclors detected in these paper residuals included 1016, 1242, 1248, 1254 and 1260. PCBs were also detected in sediment from Georgia-Pacific's storm water drainage system, which discharges to the Kalamazoo River. PCBs were also detected in a remnant of waste water from the old Georgia-Pacific clarifier. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 133. Trial Exh. 8715: BBL Tech. Memo 15, Mill Investigations, at 3-1 and 3-2.)

F-186. The average concentration of PCBs in paper residuals located on the surface of the Willow Boulevard Landfill was 88 ppm. The maximum concentration was 270 ppm. (**Trial Exh. 8738:** BBL Tech. Memo 9, Willow Boulevard/A-Site Operable Unit, at 24.)

F-187. The average concentration of PCBs in subsurface samples at the A-Site was 55 ppm with a maximum of 330 ppm. (**Trial Exh. 8738:** BBL Tech. Memo 9, Willow Blvd/A-Site Operable Unit, at 24.)

F-188. PCB-contaminated paper residuals are present in the Kalamazoo River adjacent to the Willow Boulevard Landfill. (Deposition: Cornelius at 26, 103-104. Testimony of Brown, Cross-Examination, Aug. 11, 1998.)

F-189. Various Aroclors have been detected at the Willow Boulevard/A-Site including 1016, 1242, 1248, 1254, and 1260. (**Trial Exh. 8738:** BBL Tech. Memo 9, Willow Boulevard/A-Site Operable Unit, Table 3-11. **Testimony of Brown, Cross-Examination, Aug. 11, 1998.**) The King Highway landfill contains Aroclors 1254 and 1260, as well. (**Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 130-31.**)

F-190. The maximum PCB concentration in paper residuals present in the River adjacent to the Willow Boulevard Landfill is 44 ppm with an average of 11 ppm. (**Trial Exh. 8738:** BBL Tech. Memo 9, Willow Boulevard/A-Site Operable Unit, at 25. **Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 126.**)

F-191. There is no stormwater berm at Willow Boulevard landfill, and therefore PCB-contaminated residuals in the landfill are a continuing source of PCBs to the Kalamazoo River as evidenced by 1900 cubic yards of paper waste located in the River adjacent to the landfill.

Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 126, 127-28. Deposition:

Cornelius at 26. Trial Exh. 8738: BBL Tech. Memo 9 at 25, 39.)

F-192. Georgia-Pacific produced no effluent PCB data while deinking occurred and while effluent was discharged to the Kalamazoo River. However, the presence of PCBs in residuals in the Willow Boulevard Landfill (which received PCB-contaminated residuals during the time period when Georgia-Pacific discharged clarifier effluent to the Kalamazoo River) gives rise to the reasonable inference that PCBs were present in that effluent to the River. (**Testimony** 

of Barrick, Aug. 13, 1998.) In addition, Georgia-Pacific has admitted discharging PCBs from its Kalamazoo Mill. (Admission: Plaintiff KRSG's Responses to Eaton and Rockwell's First Set of Requests for Admissions Directed to Plaintiff, dated June 3, 1997, Response 5.)

### D. Simpson-Plainwell Paper Company

F-193. Simpson-Plainwell Paper mill practiced deinking from 1910 through 1962 at its Plainwell, Michigan, mill. During this time period and afterward, Simpson's clarifier effluent was discharged to the Kalamazoo River. (**Trial Exh. 8715:** BBL Tech. Memo No. 15, p. 1-2. **Admission:** Pltf's Response to Rockwell Facts, ¶8, set out in Attachment B to these Revised Findings.)

F-194. Various types of waste paper were recycled at the Simpson mill, including office paper. One employee conducted an internal inquiry into the use of NCR paper after the MDNR began its investigation of PCB contamination in the river. He concluded that substantial amounts of NCR paper were recycled at the mill. (**Deposition:** Lawton at 72-75.)

F-195. Deinking was conducted by Simpson on a large scale. A document summarizing waste disposal practices through 1960 refers to a range of deinking volumes of 300 to 900 tons per month with suspended solids discharges to the river averaging 14,000 to 34,000 pounds per day. (**Trial Exh. 8600:** Report on waste disposal, 1947 to 1960.)

F-196. No effluent tests for PCBs exist from the time period when deinking occurred at Simpson; however, a 1973 MDNR Industrial Waste Water Survey detected .13 ppb PCBs in the Simpson clarifier's effluent discharge to the River. This detection of PCBs occurred 10 years

after deinking operations ceased at the facility. (**Trial Exh. 8602:** 1973 Wastewater Survey at p. KS 01400001.)

F-197. Annual waste water reporting forms filled out by Simpson for the Michigan Water Resources Commission during the 1970's, which reflect estimates of discharges of critical materials from Simpson's outfalls to the Kalamazoo River, indicate annual discharges of PCBs ranging from less than 11 pounds to between 11 and 100 pounds. (**Trial Exhs. 8617 & 8619:** WRC Wastewater Outfall Reports.)

F-198. From the early 1950's through the early 1980's, Simpson used the 12th Street.

Landfill, located adjacent to the Plainwell Dam on the Kalamazoo River, for disposal of its paper residuals. The fill material was deposited down a hillside into a natural depression which immediately adjoined the River and a swampy area. As a result, paper residuals are currently present in the swampy area, in the floodplain of the River and in the River itself. (**Trial Exh.**8616: MDEQ July 1997, Proposed Plan Fact Sheet, 12th Street Landfill.)

F-199. PCBs have been detected in paper residuals located in areas throughout the Twelfth Street Landfill. No consistent berm or storm water collection system existed at the landfill. At some point a berm was constructed around the perimeter of the fill area of the 12th Street Landfill. The berm is constructed of paper residuals along with sand and gravel. Some PCB-contaminated sludges have been identified on the outside of the berm, on the banks of the Kalamazoo River and into the wetland area adjacent to the landfill. (Deposition: Cornelius at 30-33, 119-128. Deposition: Lawton at 63-72. Trial Exh. 8611: 1989 letter re PCB testing of landfill. Trial Exh. 8615: Geraghty & Miller Tech. Memo 8, 12th Street Landfill Operable Unit, at 3-12 to 3-13, 6-1 to 6-2, Table 3-8. Trial Exh. 8616: MDEQ, July 1997, Proposed Plan

Fact Sheet. 12th Street Landfill Operable. Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 132.)

F-200. The presence of PCBs in Simpson's paper residuals at the 12th Street Landfill gives rise to the reasonable inference that PCBs were also present in Simpson's clarifier effluent to the Kalamazoo River. (**Testimony of Barrick, Aug. 13, 1998.**)

# VII. LIABILITY OF PLAINTIFF AND ITS MEMBER PAPER COMPANIES

L-22. There is ample evidence from which to conclude reasonably that significant and substantial quantities of PCBs were contributed by plaintiff's four member paper companies to the NPL Site, the Kalamazoo River and Portage Creek, and that those quantities are more than sufficient to justify imposing on plaintiff and its members the costs of response activities relating to the NPL Site, the River and the Creek.

L-23. Plaintiff and each of its members are liable to Eaton and Rockwell under Section 113 of CERCLA, 42 U.S.C. § 9613, for the PCB contamination of the River, the Creek, and the . NPL Site.

L-24. Judgment shall be entered in accordance with Fed. R. Civ. P. 58 in favor of defendants Eaton Corporation and Rockwell International Corporation, and against plaintiff, on the counterclaims.

Respectfully submitted,

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Dated: August 27, 1998

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Rockwell on February 2, 1998. Plaintiff's Responses are found in Exhibit A to Plaintiff's Brief in Opposition to the Motions for Summary Judgment; plaintiff's briefs are dated March 4, 1998.

- -- Pleadings by the parties, cited by title or date.
- -- Uncontroverted Facts to which the parties have stipulated. These are set out as attachments to the Joint Final Pretrial Orders submitted to the Court on August 7, 1998 (for Phase I), and November 4, 1999 (for Phase II).
- -- Opinions of this Court in this case (indicated by citation to KRSG v. Rockwell, et al., and date of opinion).

Proposed findings of fact are labeled as "F-1," "F-2," etc. Proposed conclusions of law are labeled as "L-1," "L-2," etc.

# PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW I. BACKGROUND

F-1. This matter was tried to the bench in two phases, from August 10, 1998 to August 17, 1998 (the Phase I trial) and from November 8, 1999 to November 10, 1999 (the Phase II trial). These Findings and Conclusions concern the Phase II trial and are issued in accordance with Fed. R. Civ. P. 52(a). The Court has considered opening statements of counsel, written closing arguments of counsel, proposed Findings and Conclusions from both parties, the testimony of witnesses at trial, documents and photos admitted as exhibits at trial, and deposition excerpts designated by the parties in the Joint Final Pretrial Orders. Some of the evidence offered by the parties is direct evidence, some is circumstantial. The Court has also considered what inferences can reasonably be drawn from the direct and circumstantial evidence, and has considered the demeanor and manner of the witnesses in assessing credibility of and weight to be accorded to the testimony of witnesses, including experts.

#### A. Administrative History of the Site

F-2. In August 1990, The Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site ("NPL Site") was added to the National Priorities List ("NPL") by the United States

Environmental Protection Agency ("USEPA"). The NPL Site is a 35-mile length of the Kalamazoo River from the confluence of Portage Creek with the River (in the City of Kalamazoo) to the Allegan City Dam, and a three-mile portion of the Portage Creek in the City of Kalamazoo. (Uncontroverted Facts, ¶ 2. Pleading: Restated First Amended Complaint, ¶¶ 2 and 18.)

- F-3. Plaintiff is an unincorporated association of four paper companies: Allied Paper Inc. ("Allied"), Georgia-Pacific Corporation ("Georgia-Pacific"), James River Paper Company ("James River"), and Simpson-Plainwell Paper Company ("Simpson"). (Uncontroverted Facts, ¶ 1.)
  - F-4. In 1990, the Michigan Department of Natural Resources (now the Michigan Department of Environmental Quality) ("MDNR" or "MDEQ") identified three paper mills -- Allied, Georgia-Pacific and Simpson -- as the principal sources of polychlorinated biphenyls ("PCBs") contaminating the NPL Site. (Trial Exh. 8803: Administrative Order By Consent, ¶¶ 9, 9a and 9b. Trial Exh. 8810: March 1997, MDEQ Briefing Report.)
  - F-5. Following the listing of the Site on the NPL, in December 1990, Allied, Georgia-Pacific, and Simpson entered into an Administrative Order by Consent (AOC) with MDNR to fund and conduct a Remedial Investigation/Feasibility Study of the NPL Site, including landfills and properties contiguous to the NPL Site. (Uncontroverted Facts, ¶ 5. Trial Exh. 8803: AOC, Attachment 1, "Statement of Work -- Remedial Investigation" at 1.)
- F-6. The landfills contained within the AOC Scope of Work were used to dispose of paper making residuals or "sludges" from the KRSG members' mills and some were also identified as potential sources of continuing PCB releases to the River. The landfill operable units that are part of the Site investigation ("OUs") include: (1) Allied Paper, Inc/Bryant Mill Pond (operated by Allied); (2) Willow Boulevard/A-Site (operated by Georgia-Pacific); (3) King Highway Landfill (operated by Georgia-Pacific); and (4) the 12th Street Landfill (operated by Simpson). (Testimony of Brown, Cross-Examination, Aug. 11, 1998, 112-43. Trial Exh. 8912: Map Depicting Landfills Formerly Operated by Plaintiffs.)

F-7. Although not a party to the AOC, James River has agreed to participate in the conducting and funding of the Remedial Investigation/Feasibility Study process.

(Uncontroverted Facts, ¶ 7. Deposition: Cornelius, Sept. 8, 1997 at 11. Testimony of

Brown, Cross-Examination, Aug. 10, 1998, at 64.)

F-8. The four members of the KRSG allocate costs among themselves for the investigation and remediation activities. There are segments of the River for which 100 percent of the costs are borne by a single KRSG member. (Trial Exh. 5650: Attachment to Invoice from Lettinga, setting out allocation. Testimony of Brown, Nov. 9, 1999, at 112.)

Downstream of the Simpson paper plant, expenses are divided among the four KRSG members thus: 35 percent to Allied, 35 percent to Georgia-Pacific, 15 percent to James River, and 15 percent to Simpson. (Id.) That allocation applies all the way downstream to Lake Allegan. (Id.)

### B. History of This Civil Action

F-9. Plaintiff KRSG filed this action in December 1995, seeking to recover its response costs from eight corporations, including the remaining defendant, alleging that the defendants contributed to the PCB contamination of the NPL Site. Plaintiff's claims are based upon CERCLA, 42 U.S.C. § 9601 et. seq.. (specifically upon Sections 107 and 113), the Michigan Natural Resources and Environmental Protection Act ("NREPA"), M.C.L.A. § 324.20101 et seq., and various common law theories. (Pleading: Restated First Amended Complaint.

Opinion: KRSG v. Rockwell, et al., Case No. 1:95-CV-838, Mar. 6, 1998, at 3.) This Court has previously held that, because its members are liable parties under Section 107 of CERCLA, plaintiff KRSG is restricted to a claim for contribution under CERCLA Section 113 and its counterpart under Michigan's NREPA, against remaining defendants. (Opinion: KRSG v. Rockwell, et al., Case No. 1:95-CV-838, Jan. 16, 1998.)

F-10. Plaintiff voluntarily dismissed its claims against one defendant (Hercules), settled with another (Rock-Tenn), and the Court previously granted summary judgment in favor of two others (Upjohn and Menasha) and in favor of two of the three Eaton plants alleged by plaintiff to

be contributors of PCBs to the River. The liabilities of Eaton (with respect to one remaining plant) and of Rockwell were determined after the Phase I trial, a bench trial.

F-11. Following the Phase I trial in August 1998, the Court entered judgment in Eaton's favor on its remaining plant and in plaintiff's favor against Rockwell on liability. This Court concluded that "Rockwell's release of PCBs to the River was more than incidental or sporadic." (Opinion: KRSG v. Rockwell, et al., Case No. 1:95-CV-838, Dec. 7, 1998, at 41-42.)

F-12. Rockwell has filed counterclaims against plaintiff and its members, alleging that plaintiff's members are responsible for the PCB contamination under Section 113 of CERCLA, NREPA, and various common law theories. (Pleading: Counterclaim of Rockwell, dated Sept. 26, 1996.) The issues of liability in these counterclaims were also tried to the Court in the Phase I trial. The Court concluded that the "contributions of PCBs to the NPL Site by Allied, James River, Georgia-Pacific and Simpson, individually and together, are in nature, quantity and durability sufficient to require imposing the costs of response activities for the NPL Site upon each of those four parties." As a result of the Phase I trial, this Court entered judgment on the counterclaim in favor of Rockwell and against the KRSG on liability. (Opinion: KRSG v. Rockwell, et al., Case No. 1:95-CV-838, Dec. 7, 1998, at 12.)

F-13. The Phase II trial, conducted from November 8 through November 10, 1999, concerned allocation of responsibility among liable parties. Proofs were presented concerning the quantification of PCBs contributed to the River by plaintiff's members and Rockwell.

L-1. The proofs at the Phase II trial confirm this Court's previous conclusion, reached after the Phase I trial, that the contributions of PCBs to the NPL Site by Allied. James River, Georgia-Pacific and Simpson, individually and together, are in nature, quantity and durability sufficient to require imposing the costs of response activities for the NPL Site upon each of those four parties. Having found that Allied, James River, Georgia-Pacific, Simpson and Plaintiff KRSG, as an unincorporated association of these four paper companies, are each liable and responsible parties under Section 107 of CERCLA, 42 U.S.C. § 9607, this Court concludes that these parties shall bear 100 percent of the responsibility for the PCB contamination of the NPL

Site, and that this allocation is fair, equitable, supported by the evidence and the circumstances. The paragraphs that follow detail this Court's understanding of the evidence concerning the relative contributions of PCBs to the River by plaintiff's members and Rockwell.

## II. ALLOCATION CONSIDERATIONS AND THE "GORE" FACTORS

- L-2. The Sixth Circuit case of <u>United States v. R. W. Meyer, Inc.</u>, 932 F.2d 568 (6th Cir. 1991), provides the standard by which this Court must determine an equitable allocation among liable parties in this case. It provides that, in allocating in contribution actions, the court may consider "any factor it deems in the interest of justice in allocating contribution recovery." <u>Id.</u> at 572. The trial court had considered and balanced several equitable factors, among them the amount of waste discharged, the degree of toxicity of the waste, the degree of involvement of the parties in the disposal of the waste, the exercise of care by the parties with respect to the waste, and the degree of cooperation with governmental agencies to prevent any harm to the public health or the environment. <u>Id.</u> at 571. These factors, called the "Gore" factors, were proper considerations, held the Sixth Circuit, although trial courts are not limited to the Gore factors. <u>Id.</u> at 572. The trial court has broad discretion in making these equitable determinations; equitable balancing is subject to review for abuse of discretion. <u>Id.</u> at 573.
  - L-3. The parties have agreed that the three "Gore" factors that are most relevant to this Court's decision in this case are those of volume, toxicity, and cooperation with governmental authorities.
- L-4. Also relevant to this Court's determination is the recent decision from the First Circuit, in a similar context (although not a river environment), of <u>Acushnet Co. v. Mohasco Corp.</u>, 191 F.3d 69, 1999 U.S. App. LEXIS 22498 (1st Cir. 1999). In <u>Acushnet</u>, the Court of Appeals upheld the trial court's grant of summary judgment in favor of several defendants in a CERCLA contribution action. The court concurred with the holdings of several courts, finding that not all potentially responsible parties must be jointly and severally liable for all response

costs, and that not all must even bear <u>any</u> portion of the response costs. The appellate court cited with approval a decision of the Second Circuit, holding that:

[A defendant] may escape any liability for response costs if it either succeeds in proving that its [waste], when mixed with other hazardous wastes, did not contribute to the release and cleanup costs that followed, or contributed at most to only a divisible portion of the harm.

<u>United States v. Alcan Aluminum Corp.</u>, 990 F.2d 711, 722 (2d Cir. 1993), quoted in <u>Acushnet</u>, 1999 U. S. LEXIS 22498 at \*21. Finding that the circumstances in <u>Acushnet</u> warranted it, the court concluded that "[i]n an appropriate set of circumstances, a tortfeasor's fair share of the response costs may even be zero." <u>Acushnet</u>, <u>supra</u> at \*24. The Court noted that "there is nothing to suggest that Congress intended to impose far-reaching liability on every party who is responsible for only trace levels of waste." <u>Id.</u>

L-5. The <u>Acushnet</u> court concluded that, where a defendant added "no more than negligible amounts of existing [hazardous wastes] in the surrounding region," <u>Acushnet</u>, <u>supra</u> at \*27, an allocation of zero to that defendant was appropriate and equitable.

# III. POLYCHLORINATED BIPHENYLS ("PCBs")

### A. Use In Carbonless Papers

- F-14. Polychlorinated biphenyls ("PCBs") were produced in the United States from the 1940s through the 1970s exclusively by Monsanto Industrial Chemicals Company ("Monsanto"). which marketed the compounds under the trade name "Aroclor." (Opinion: KRSG v. Rockwell, et al., Case No. 1:95-CV-838, Mar. 6, 1998, at 2.)
- F-15. PCBs were most commonly used in electrical components such as capacitors and transformers, but they were also used in the paper industry. Between 1957 and 1971, a type of carbonless copy paper typically referred to as "NCR paper" incorporated PCBs as an ink carrier or solvent. (Trial Exh. 8017: "PCBs Involvement In The Pulp and Paper Industry", p.2, Versar, Inc., Feb. 1977, at 2. Testimony of Barrick, Aug. 13/14, 1998, at 118.)

F-16. The recycling of carbonless copy paper by the paper companies was a major source of the PCBs at the NPL Site. (Trial Exh. 8812: USEPA Action Memorandum. Testimony of Brown, Cross-Examination, Aug. 10, 1998, at 60. Opinion: KRSG v. Rockwell, et al., Case No. 1:95-CV-838, Mar. 6, 1998, at 2-3.) One industry research study stated, "It has been recognized for several years that effluents from paper mills contain environmentally significant quantities of PCBs . . . . [T]he major source of process contamination by PCBs appears to be carbonless copy paper contained in recycled waste paper." (Trial Exh. 8017: "PCBs

Involvement In The Pulp And Paper Industry," Versar, Inc., Feb. 1977, at 3.) During the late 1950's through the 1970's, carbonless copy paper was often found in office waste paper and other categories of waste paper commonly referred to as "mixed office waste," "ledger paper" and "colored ledger paper." These types of papers provided the furnish for recycling operations by each of the plaintiff's member companies. (Depositions: Hanson at 27-30; Gilman at 29-31; 105-108; Lawton at 72-75; Huisman at 24. Trial Exh. 8012, 8013: 1976 memos of Brown Company, the predecessor to James River.)

#### B. Aroclors and Their Applications

F-17. Aroclor 1242, a mixture of PCBs containing an average of 42 percent chlorine, was sold by Monsanto and used in carbonless copy paper as an ink carrier or solvent during the period 1957-71. The total amount sold for this purpose was 44,162,000 pounds, approximately 28 percent of the total estimated Monsanto sales of PCBs for plasticizer applications and 6.3 percent of total Monsanto domestic sales of PCBs during 1957-71. The average content of Aroclor 1242 in the carbonless copy paper was 3.4 percent. (Trial Exh. 8017: "PCBs Involvement In The Pulp and Paper Industry," Versar, Inc., Feb. 1977, at 2.)

F-18. Other PCBs, primarily Aroclor 1254, were used in printing inks. (Trial Exh. 8017: "PCBs Involvement In The Pulp And Paper Industry," Versar, Inc., Feb. 1977, at 3. Testimony of Barrick, Aug. 13/14, 1998, at 118, 121-22.)

- F-19. A number of authoritative studies have concluded that Aroclor 1254 is found in paper and paperboard products, including the types which were produced and recycled by plaintiff's members' mills. (Testimony of Barrick, Aug. 13/14, 1998, 122-23. Testimony of Brown, Rebuttal Cross-Examination, Aug. 17, 1998, at 20-21.)
- F-20. The chemical composition of a PCB compound can be measured and analyzed by gas chromatography (in a process called "Gas Chromatograph/ Electron Capture Detection" or "GC/ECD"), which results in a computer-generated graph depicting the constituents and levels of constituents found in the PCB sample. GC/ECD graphs of PCB samples can be compared to determine whether two PCB samples are made up of the same or different Aroclors. The GC/ECD graph of a PCB sediment sample can be compared to the graphs of PCB "standards," controlled samples whose Aroclors are known, in order to identify the particular Aroclor in the sediment sample. (Testimony of Barrick, Aug. 13/14, 1998, 41-50.)
- F-21. These depictions are referred to as "fingerprints." They represent the overall picture of Aroclor distributions and the relationship between Aroclors. (Testimony of Barrick, Nov. 10, 1999, at 47.)
- F-22. Despite the ability to distinguish among Aroclors, the MDEQ regulates PCBs with regard to the total concentration of PCBs and does not, for example, regulate Aroclor 1242 any differently than Aroclor 1254 or any other PCB Aroclor or congener. (Deposition: Cornelius, Oct. 12, 1999 at 77-80. Testimony of Barrick, Nov. 10, 1999, at 87-88. Testimony of Brown, Nov. 9, 1999, at 73.)
- F-23. Both Aroclors 1242 and 1254 contain a number of the most toxic congeners and, therefore, are not regulated differently by regulatory agencies. (Testimony of Barrick, Nov. 10, 1999, at 87-88.)

# C. Properties of PCBs

- F-24. PCBs were about 5 to 6 times more costly than petroleum based oils, on a price per gallon basis. (Admission: Pltf's Response, March 4, 1998, to Eaton's Undisputed Facts in support of Eaton's Motion for Summary Judgment, ¶ 90.) In 1972, mineral oil, a substitute for PCBs in low temperature applications, cost 5 to 6 times less than PCBs. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 165-67.)
- F-25. The experts agree that if a source of PCBs is present, PCB concentrations are higher in water containing a higher percentage of solids because of the tendency of PCBs to attach to solids. (Testimony of Connolly, Aug. 14, 1998. Testimony of Brown, Cross-Examination, Aug. 10, 1998, at 77-79.)
- F-26. PCBs in oil will stay with the oils when they meet water. They are most similar chemically to the oil, and have only a very low solubility in water. PCBs will preferentially adhere to soils and are generally not transportable in groundwater. (Testimony of Barrick, Nov. 10, 1999, at 98-99.)
- F-27. When present in groundwater, oils containing small amounts of PCBs often float on top of the groundwater. These are referred to as "light non-aqueous phase liquids," or "LNAPLs." However, oils containing larger proportions of PCBs will sink below groundwater. For example, hydraulic oils containing no PCBs are lighter than water. Adding approximately 20 percent PCBs will cause the oil to become denser than water, thus causing it to sink. A hydraulic oil with 20 percent PCBs would be measured at 200,000 ppm PCBs, and it would not float on top of water. Such a mixture would be called a "dense non-aqueous phase liquid," or "DNAPL."

(Testimony of Barrick, Nov. 10, 1999, at 100-101.)

F-28. The higher the concentration of PCBs in oil, the heavier the oil, and the more likely the oil will not float a great distance and allow the PCBs to be transported a great distance. (Testimony of Barrick, Nov. 10, 1999, at 27-28.)

## IV. DEFENDANT ROCKWELL

## A. The Rockwell Plant and the River

F-29. Rockwell International Corporation owned property and a manufacturing plant at 1 Glass Street, Allegan. Rockwell and its predecessors operated that plant from the early 1900s until approximately 1988-89. The plant, which manufactured universal joints for the automotive industry, was located on the Kalamazoo River, downstream of the Allegan City Dam.

(Uncontroverted Facts, ¶ 28. Admission: Pltf's Response, March 4, 1998, to Rockwell's Undisputed Facts in support of Rockwell's Motion for Summary Judgment, ¶ 22. Trial Exh. 8914: Map depicting Rockwell Facility Location.)

F-30. The portion of the Kalamazoo River adjacent to the former Rockwell plant is not within the NPL Site as defined by the Administrative Order by Consent entered into by Allied, Georgia-Pacific and Simpson. (Admission: Pltf's Response, March 4, 1998, to Rockwell Facts, ¶ 23.) Even to the extent Rockwell may have released PCBs to the Kalamazoo River, plaintiff's expert quite reasonably concedes that those PCBs cannot come to be located within the NPL Site because it is upstream of Rockwell. (Testimony of Brown, Nov. 9, 1999, at 102.)

F-31. Rockwell was not an owner of riparian land within the NPL Site as defined by the AOC entered into by Allied, Georgia-Pacific and Simpson. (Uncontroverted Facts, ¶ 29.)

F-32. The former Rockwell Allegan facility is a Superfund Site separate and apart from the Superfund Site on the Kalamazoo River. USEPA investigated the Rockwell property in 1984 and detected a number of hazardous substances, like metals, but not PCBs. In 1988, based in part on EPA's findings, Rockwell entered into an AOC with the EPA to undertake a remedial investigation and feasibility study of the property. The Rockwell property became a Superfund Site because of heavy metals and other chemicals, not because of PCBs. (Testimony of Shafer, Nov. 9, 1999, at 110. Uncontroverted Facts, ¶ 33. Trial Exh. 1002: Rockwell AOC.)

F-33. The EPA has not required Rockwell to include any section, in any of the four multi-volume Remedial Investigation reports prepared with respect to the Rockwell Site,

concerning discharges of PCBs that may have come from the Rockwell property to the River. (Testimony of Shafer, Nov. 9, 1999, at 107.)

#### B. Rockwell's Use of Oils

1.1

F-34. From 1945 until the early 1960s, Rockwell discharged its industrial wastewater into the Kalamazoo River following treatment in the Oil Flotation House. The wastewater from the Oil Flotation House contained certain amounts of sludge, heavy metals, process wastes, and oil. Rockwell's wastes included machine coolants, oily wastewaters, and spent cutting oils. There are no records indicating that the Rockwell plant purchased quench oils, cutting oils or hydraulic oils containing PCBs. There is also no evidence that Rockwell conducted forging, die casting or other extremely high temperature operations that might have benefitted from the fireresistant qualities of PCB-containing oil. From the early 1960s onward, Rockwell began making increasing use of water-based process oils, i.e., water-soluble oils. Because PCBs do not readily mix with water, they are an unlikely additive to water soluble oils. Beginning in that time frame, Rockwell discharged its waste oils into the soluble oil separation pond. In 1972, Rockwell constructed a wastewater treatment plant. In 1978 Rockwell advised its oil waste hauler that information obtained from OSHA Material Safety Data sheets and its suppliers indicated that Rockwell's waste oil did not contain any PCBs. The wastewater effluent from Rockwell's treatment ponds was tested by the MDNR in 1976 and 1986. Those tests found no PCBs in Rockwell's outfall to the Kalamazoo River. (Trial Exh. 1004, 5012, 5014, 5025, 5027 and 8931.)

F-35. Rockwell's expert, Robert Barrick, testified that, based upon the concentrations of PCBs found on the Rockwell property, he concluded that the PCBs found in Rockwell's oils were the result of incidental contamination. "The levels that were there are very small, and this was in the time when there was a lot of oil being used, oil tankers going around. Sometimes they could potentially have PCB oils transported, other times just regular oils, and without washing things out, you could easily get some contamination." (Testimony of Barrick, Nov. 10, 1999, at

44, 88-89. See also testimony of Barrick, Aug. 1314, 1998, at 71-72.) Those low level and incidentally contaminated oils were handled or spilled at various areas of the Rockwell property, thus leading to the discovery of small amounts of PCBs on the property. (Id. Nov. 10, 1999, at 43.)

F-36. Mr. Barrick's personnel made field observations of the presence of petroleum and grease odor in sediment samples collected in May 1999 adjacent to and downstream of the Rockwell facility. According to this field work, and corresponding lab analysis for PCBs in the samples, there is no correlation between the observable presence of oil/grease and PCB concentrations. Higher concentrations of PCBs were found in the samples having the least petroleum odor. This means that the PCBs in these sediments came from non-petroleum sources upstream of Rockwell and that there was no consistent discharge of PCBs in oil from the Rockwell facility. (Testimony of Barrick, Nov. 10, 1999, 52-54. Trial Exh. 5641.)

## C. Additional Sampling of the River Sediments Near Rockwell

F-37. Rockwell's expert, Robert Barrick, explained the locations and results of additional sampling he conducted in the River. in order to analyze the possibility of PCB discharges from the Rockwell property. Since the Phase I trial, Rockwell's consultant has analyzed additional samples from River sediments in a number of depositional zones in the River, in an attempt to determine whether the mixture and characteristics of Aroclors reflect any change at or near the Rockwell facility. (Testimony of Barrick, Nov. 10, 1999, at 28-33.) Trial Exhibit 5632 depicts the locations and numbers of sediment cores and samples analyzed by Mr. Barrick (some cores taken by him and others taken by plaintiff's experts) for reaches of the River both upstream and downstream of the Rockwell property. (Trial Exh. 5632.)

F-38. In this Court's opinion from the Phase I trial, the Court indicated that there was "insufficient evidence of the sampling techniques used by Mr. Barrick to conclude that the sampling was taken from depositional areas where PCBs from Rockwell's oils would be expected to have come to rest." (Opinion: KRSG v. Rockwell, et al., Case No. 1:95-CV-838,

Dec. 7, 1998, at 41.) Mr. Barrick has, since that time, taken an additional 25 cores from the River, 12 of which were located in new areas never before sampled. Each core yielded more than one sample, sometimes ten or more. (Testimony of Barrick, Nov. 10, 1999, at 29-32.)

F-39. Trial Exhibit 5633 is an aerial photograph on which Mr. Barrick has indicated the depositional areas of the River in which oils would be expected to accumulate. The River environment was studied by a geologist, a geomorphologist, and Mr. Barrick to determine the location of depositional areas downstream of Rockwell. Mr. Barrick's recent sampling was conducted in these depositional areas. (**Testimony of Barrick**, **Nov. 10**, **1999**, **at 33-36**.)

L-6. This Court is persuaded that the additional sampling and analysis conducted by Rockwell's consultant more than adequately addresses the Court's previous concern about the representative nature of the sampling. The Court concludes that the total sampling (by all those who sampled) and analysis by Mr. Barrick reflect sound scientific methodology and yield reliable results. This Court concludes that the consistency of the "fingerprint" or Aroclor ratios in cores upstream of, downstream of, and adjacent to the former Rockwell plant indicates that Rockwell did not contribute any detectable or significant quantity of PCBs above those background levels already present in River sediments from upstream sources.

### D. Comparison of PCBs at Rockwell and In The River

F-40. Where PCBs were detected on the Rockwell property, the dominant Aroclor mixture found is Aroclor 1254. When PCBs have been detected in various places in the River sediments, Aroclor 1242 is the dominant PCB mixture. Aroclor 1242 is the dominant PCB mixture detected both upstream and downstream of the former Rockwell plant. (Testimony of Barrick, Aug. 13/14, 1998, at 109-110. Opinion: KRSG v. Rockwell, et al., Case No. 1:95-CV-838, Dec. 7, 1998, at 41.)

F-41. Aroclor 1242 is not characteristic of the PCB mixture found on the Rockwell property. The dominant PCB composition detected on the Rockwell property is Aroclor 1254. (Testimony of Barrick, Aug. 13/14, 1998, at 72. Trial Exhs. 8915, 8923, 8924, 8918, 8920

and 8927: Illustrative exhibits depicting PCBs sampled upstream and downstream of Rockwell and on Rockwell property.)

F-42. The composition of PCBs found downstream of the former Rockwell plant matches the composition of PCBs found upstream of the Rockwell plant, and does not match the composition of PCBs found on Rockwell property. This indicates that PCBs detected in River sediments came from releases upstream and did not migrate from the Rockwell property. (Testimony of Barrick, Nov. 10, 1999, 46-58, 76-81. Testimony of Barrick, Aug. 13/14, 1998, at 108-110. Trial Exhs. 8920, 8924, 8927: Illustrative exhibits comparing PCB gas chromatographic fingerprints.)

F-43. If Rockwell had released PCBs to the River, those PCBs (composed of Aroclor 1254) would have increased the ratio of Aroclor 1254 to Aroclor 1242 (the dominant Aroclor) in sediments downstream of Rockwell. In sediment samples taken upstream of Rockwell and downstream of Rockwell, a comparison of the gas chromatographic "fingerprints" indicates that the ratio of Aroclor 1242 to Aroclor 1254 is relatively constant, averaging between four and six parts Aroclor 1242 to one part Aroclor 1254 (4:1 to 6:1) throughout the River, indicating again that there was no measurable, independent release of PCBs from the Rockwell plant. (Testimony of Barrick, Nov. 10, 1999, at 70-71; Aug. 13/14, 1998, at 105-110. Trial Exhs.

8919, 8920, 8927: Illustrative charts comparing PCB fingerprints.)

F-44. In one area 1.7 miles downstream of Rockwell, one core (called "BR-27") showed elevated levels of 1254, representing an unknown local source or some kind of dumping in that immediate area of the River. However, 130 samples were taken from the several depositional areas between Rockwell and BR-27; none of those 130 samples indicated any evidence of a discharge of 1254 from Rockwell's plant. (Testimony of Barrick, Nov. 10, 1999, at 74-76.) Moreover, samples downstream of BR-27 also do not show an increase in Aroclor 1254 concentrations. This Court is persuaded, from the evidence presented, that it is implausible that a discharge from Rockwell would be reflected in only one sample location (BR-27), while no evidence of such a discharge is seen in any other sediment samples between Rockwell and BR-

27. (Testimony of Barrick, Nov. 10, 1999, at 189.) Furthermore, BR-27 is not indicative of discharges from Rockwell, because the samples from BR-27 show both 1254 and 1242; any discharge by Rockwell to that geographic area would have to be matched, in perfect proportion, by some discharge of 1242 only, an event which, in Mr. Barrick's opinion, is highly improbable. (Testimony of Barrick, Nov. 10, 1999, at 135.)

F-45. The findings at BR-27 demonstrates that the fingerprint or ratio method used by Mr. Barrick can indeed detect localized sources of 1254 such as would be true if Rockwell were discharging 1254 to the River. The absence of an increase in 1254 downstream of Rockwell, in 130 samples, constitutes credible and persuasive evidence that the former Rockwell Allegan facility is, at best, an inconsequential source of PCBs to the Kalamazoo River, and did not rise above the background level of 1254 existing in the River from other sources.

F-46. In fact, Mr. Barrick's analysis shows that the highest absolute concentrations of Aroclor 1254 are <u>upstream</u> of Rockwell, and he sees no increase in absolute concentrations at or near Rockwell. (Testimony of Barrick, Nov. 10, 1999, at 78.)

L-6. Plaintiff presented no persuasive evidence to contradict the opinions of Mr. Barrick concerning the gas chromatograph or "fingerprint" analysis performed by him of PCBs in the Site. The fingerprint analysis is reliable, and Mr. Barrick's testimony concerning his findings is credible and persuasive. Fingerprint analysis has been relied upon by other courts, see Anglado v. Leaf River Forest Prods, Inc., 1998 WL 286610 (Miss. S. Ct. 1998), and is, in this instance, supported by sound expert testimony, foundation and interpretation. This Court accepts his analysis of the sediments, and their Aroclor characteristics, and accepts his conclusions concerning the consistency of those characteristics both upstream and downstream of Rockwell. This Court accepts his conclusions that there is no reliable scientific evidence that Rockwell contributed Aroclor 1254 to the River sediments.

#### E. Evidence of Other Sources

- F-47. Plaintiff's expert has conceded that background PCBs in sediments most closely resemble Aroclor 1254. (Testimony of Brown, Nov. 9, 1999, at 68-69.)
- F-48. Sediment sampling in Portage Creek, near the confluence of the Creek and the Kalamazoo River, and in nearby landfills of the plaintiff paper companies, shows the presence of Aroclors 1242 and 1254, as well as other Aroclors. (Testimony of Barrick, Aug. 13/14, 1998, at 119-21. Trial Exhs. 8925, 8926, 8927: Illustrative exhibits depicting congener analysis of PCBs found in Portage Creek and Lake Allegan.)
- F-49. The deinking operations of plaintiff's paper recycling mills, not Rockwell's operations, were likely sources of Aroclor 1254 as well as of Aroclor 1242 found in River sediments. (Testimony of Barrick, Aug. 13/14, 1998, at 117-23.)
- F-50. Aroclor 1254 is present in sediment samples taken from upstream of Rockwell, indicating that there are upstream sources of Aroclor 1254. (Testimony of Brown, Nov. 9, 1999, at 64-67. Testimony of Barrick, Nov. 10, 1999, at 14-15.)
- F-51. Sediments directly off the outfall of the upstream Allegan publicly-owned treatment works ("POTW") adjacent to the Rockwell facility have a different physical appearance from the rest of the Kalamazoo River sediments and have elevated concentrations of Aroclor 1254 relative to Aroclor 1242/48. This is indicative of the local contribution by this source and does not occur near the Rockwell facility; the depositional areas near Rockwell would reflect any 1254 added by Rockwell if there were such discharges, and those areas show no such 1254. Downstream locations are also consistent with this observation. (**Testimony of Barrick**, **Nov. 10, 1999, at 47-49, 70.**)
- F-52. Plaintiff's expert has conceded that the sources of Aroclor 1254 to the River include plaintiff's member mills, the Auto Ion site upstream of Rockwell, the Publicly-Owned Treatment Works for the cities of Allegan, Otsego, Plainwell and Kalamazoo, upstream of Rockwell, as well as existing background levels of 1254. (Testimony of Brown, Nov. 9, 1999, at 58-61, 62-64, 64-69, 76.) Rockwell's expert, Mr. Barrick, agrees that these are sources of

Aroclor 1254 to the River, and also sees evidence of one other localized source, downstream of Rockwell, in the vicinity of sediment core BR-27. (Testimony of Barrick, Nov. 10, 1999, at 73-76. Trial Exh. 5638.)

F-53. The number of samples analyzed by Mr. Barrick provides persuasive evidence that. although there are several sources of 1254 to the River, Rockwell is not among them.

### F. Fish Studies

F-54. Plaintiff's expert, Dr. Brown, concedes that Aroclors 1254 and 1260 have been detected in residuals from the paper companies' facilities. He also concedes that levels of Aroclor 1254 have been detected in fish caught in Portage Creek, and that those levels are significantly higher than the levels of 1254 in those caught in Morrow Lake. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 150-53.) Aroclor 1254 and 1260 were detected in fish caught in the River near the Simpson-Plainwell facility location, and the concentrations of 1254 found in fish further downstream (but upstream of Rockwell) were "considerably higher," about ten times higher, than the concentrations in Morrow Lake fish. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 153-54.)

F-55. These disparities in concentration between Morrow Lake fish and downstream fish further support the conclusion that the most significant sources of PCBs to the River, including Aroclors 1254 and 1260, begin in the vicinity of plaintiff's members' mills.

F-56. Dr. Brown concedes, too, that the fish, by feeding on the River bottom downstream of Morrow Lake, and on its food sources, have a natural way of averaging out the relative amounts of Aroclors in the feeding areas of the River. (Testimony of Brown, Nov. 9, 1999, at 81.)

F-57. The available fish tissue data for the Kalamazoo River do not show differences among fish that would indicate any change in PCB composition in the sediments upstream and downstream of the Rockwell facility. If there is any trend at all, there is a subtle increase in Aroclor 1242 relative to Aroclor 1254 downstream, not a decrease. These data are consistent

with Mr. Barrick's sediment fingerprint analysis showing no meaningful contribution of PCBs from the Rockwell facility. (Testimony of Barrick, Nov. 10, 1999, at 83, 85.)

F-58. The fish serve as an independent verification of Mr. Barrick's sediment analysis: the consistent PCB composition in fish tissue immediately upstream and downstream of Rockwell corroborates the consistent ratios found in sediments. (**Testimony of Barrick, Nov. 10, 1999, at 86-87.**)

### G. Volume

F-59. The only substantial releases of oil from the Rockwell facility were from Outfall Number One, the old outfall that received discharges from the Oil Flotation House. There is no evidence that substantial quantities of oil were released by any other means, including from leaching or surface runoff from the site. Further, in other areas where small amounts of oil were detected (as in oil seeps causing a sheen on the River), the oils were tested and no PCBs were present. (Testimony of Barrick, Nov. 10, 1999, at 89-92.)

L-7. This Court rejects the analysis by plaintiff's expert, Dr. Crumrine, who used speculative assumptions about Rockwell's discharges, based upon a single data point for each of two multi-year periods totalling 32 years. A single measurement of a discharge, taken at a single location and point in time should be the basis for extrapolation to a multi-year time period.

Textron, Inc., v. Barber-Coleman Co., 903 F. Supp. 1546, 1555 (W.D.N.C. 1995): Renaud v. Martin Marietta Corp., 749 F. Supp. 1545, 1553 (D. Colo. 1990), aff'd, 972 F.2d 304 (10th Cir. 1992). (See also Opinion: KRSG v. Rockwell, et al., Case No. 1:95-CV-838, June 30, 1998, at 22.)

F-60. Furthermore, there is no evidence that the presence of oil equates with the presence of PCBs at the Rockwell or in historical discharges of oily waste from that facility. Dr. Crumrine's assumption that the oils used at the site contained high levels of PCBs. 50% PCBs for hydraulic fluid and 5% PCBs for cutting oils, is contradicted by the actual site data from the Rockwell property: a cutting oil that contains 5 percent PCBs would be measured as 50,000 ppm PCBs. It is physically impossible, under the circumstances at the Rockwell property. for a

concentration of 50,000 ppm to get reduced to the 9 ppm concentration found on the property. The same is true for an hydraulic oil containing 50 percent, or 500,000 ppm, PCBs. (Testimony of Barrick, Nov. 10, 1999, at 102-104.)

- F-61. Oil floating on groundwater is referred to as "light non-aqueous phase liquid," or "LNAPL." (Testimony of Barrick, Aug. 13/14, 1998, at 71-72.) When oil is too heavy to float on the groundwater, it is called "dense non-aqueous phase liquid," or "DNAPL." (Testimony of Barrick, Nov. 10, 1999, at 101.)
- F-62. The oil in the LNAPL layer found on the Rockwell property is characteristic of incidental PCB contamination in the oils used by Rockwell; there is no basis for concluding that the oils used in manufacturing by Rockwell contained significantly greater proportions of PCBs than what is found in the LNAPL. (Testimony of Barrick, Nov. 10, 1999, at 102.)
- F-63. Plaintiff has presented no credible or persuasive scientific evidence by which to conclude that oils containing 5 to 50 percent PCBs could be used regularly and discharged for 32 years and nevertheless yield LNAPL containing less than 10 ppm of PCBs. Rockwell's expert has presented persuasive evidence to the contrary. (Testimony of Barrick, Nov. 10, 1999, at 102-104.) By contrast, NCR paper contained 3.4 percent PCBs (and deinking effluent contained less than this) and the effects of those discharges are seen clearly everywhere in the River, by clear detections of significant amounts of PCBs. (Trial Exh. 8017, at p. 2-3. Testimony of Brown, Aug. 10, 1998, at 60.)
- F-64. If the hydraulic oils used by Rockwell were 50 percent PCBs as posited by Dr. Crumrine, those oils would be denser than water, and would sink below the water, to be found as DNAPL deposits. No DNAPL has ever been detected on the Rockwell property. (Testimony of Barrick, Nov. 10, 1999, at 101.)
- F-65. Even if Dr. Crumrine's assumptions of the volume of hydraulic oil discharged from Rockwell were accurate (1,016 gallons), using the actual concentration of PCBs in Rockwell's LNAPL (9.2 ppm) indicates that Rockwell's potential contribution to the mass of PCBs in Lake Allegan would be less than 0.0002 percent. Similarly, utilizing actual data from

## UNITED STATES DISTRICT COURT WESTERN DISTRICT OF MICHIGAN SOUTHERN DIVISION

Calamazoo	River Study Group,	

Civil Action No. 1:95CV838

Rockwell International

ν.

Hon. Robert Holmes Bell

Defendants.

Plaintiff,

## ROCKWELL'S PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW SUBMITTED AFTER PHASE II TRIAL

Defendant Rockwell International Corporation, by its attorneys, Dykema Gossett PLLC, hereby submits Proposed Findings of Fact and Conclusions of Law, after the Phase II trial conducted in November 1999. These Findings have been amended to conform to the proofs submitted at trial, and includes references to proofs in Phase I as well as Phase II. The proofs adduced at trial for each proposed Finding are indicated in parentheses at the conclusion of each numbered paragraph. A copy has been served on plaintiff's counsel, and an electronic copy of these Findings is also being submitted to the court on electronic diskette, in WordPerfect format.

These Findings and Conclusions are supported by:

- -- Trial testimony (indicated by witness name, date of testimony and, in the case of witnesses whose trial testimony has been transcribed, page number);
- -- Deposition testimony (indicated by witness name and page numbers) located in Bench Books provided to the Court by the parties, containing designated excerpts of deponents;
- -- Trial exhibits (indicated by Trial Exhibit number);
- -- Admissions by plaintiff or its counsel (indicated by a reference to the specific pleadings and discovery documents). Frequently these admissions are contained in Plaintiff's Responses to certain undisputed facts offered by Rockwell (and in some cases, co-defendant Eaton) when defendants moved for summary judgment before the Phase I trial. Reference is made to responses by plaintiff to facts offered by defendants as undisputed. The fact in question is contained in the List of Undisputed Facts accompanying the Brief in Support of Motion for Summary Judgment, filed by Eaton and

the Rockwell property (9.2 ppm PCBs in LNAPL), Dr. Crumrine's assumptions regarding the volume of cutting oil discharged (10,000 gallons, or 10 times more than hydraulic oil) yield only a .002 percent contribution by Rockwell to the mass of PCBs in Lake Allegan. Even using the highest PCB detection on the Rockwell property, 35 ppm in soil (not LNAPL) (see testimony of Barrick, Nov. 10, 1998, at 44-45), and using Dr. Crumrine's assumed dischage volumes, nevertheless those numbers yield a theoretical contribution not even four times greater, or .008 percent. In any event, such a contribution, if indeed it ever occurred, is negligible and does not rise above background concentrations of PCBs in the River. (Testimony of Barrick, Nov. 10, 1999, at 112-115.)

## H. Toxicity

F-66. The basis used to establish regulatory criteria and fish advisories is the presence of total PCBs. Thus, the regulatory criteria apply to PCBs generally, and do not distinguish among Aroclor mixtures, such as Aroclor 1242, Aroclor 1254, and Aroclor 1260. (Testimony of Barrick, Nov. 10, 1999, at 87-88.) The MDEQ will be using total PCB levels, not specific Aroclor levels, as the standard for the cleanup and remedy for the Kalamazoo River. (Testimony of Brown, Nov. 9, 1999, at 73.)

F-67. There is evidence of greater carcinogenicity for more highly chlorinated PCB mixtures (those with higher molecular weights). Plaintiff thus contends that Aroclor 1254 is more toxic than 1242, and thus, a smaller contribution of 1254 by Rockwell should be weighted disproportionately heavily. However, Rockwell presented evidence that Aroclor 1242 contains a particularly toxic congener, known as Congener 77. That congener makes up a greater percentage of 1242 than it does of 1254 (in which it is also found, but in smaller amounts). (Testimony of Brown, Nov. 9, 1999, at 70-71.) Plaintiff's expert conceded on cross-examination that there can be such large amounts of 1242 present in the River that on a relative basis, that 1242 is as toxic or more toxic than the smaller amounts of 1254 also present. (Testimony of Brown, Nov. 9, 1999, at 71.)

L-8. In light of the larger amount of Aroclor 1242, the consistent ratio of 1242 to 1254 unaffected by any alleged release from Rockwell, the consistent concentration of 1254 in fish both upstream and downstream of Rockwell, and the regulatory focus on total PCBs, not on specific Aroclors, this Court concludes that toxicity is a factor which is neutral in this case. That is, the toxicity of the alleged releases from Rockwell are without significance to this River, as compared to the discharges from plaintiff's member mills.

# I. Cooperation With Governmental Authorities

F-68. The trial exhibits reflect a lengthy, detailed correspondence between Rockwell and EPA concerning the Rockwell Site history and other information that will form the basis for future action at the Site. The letters back and forth contain comments, questions and efforts to corroborate the hundreds of pieces of information assembled in the multi-volume Remedial Investigation reports. The correspondence reflects Rockwell's disagreement with EPA and an EPA contractor over the nature and extent of contamination at the Rockwell Site (much of which relates to contaminants other than PCBs), the techniques to be used to investigate the Site, and the steps to be taken to address any contamination found. Rockwell concluded that the assertions of EPA were factually insupportable, and Rockwell provided to EPA its basis for concluding that EPA was reaching incorrect conclusions. The correspondence culminated in a request by Rockwell to utilize alternative dispute resolution methods, permitted by the Administrative Order of Consent, in order to allow an independent third party to review the administrative record and the conclusions reached unilaterally by EPA. (See Trial Exh. 5059, August 3, 1998, letter from Furlough to Muno. See also Trial Exhs. 5042, 5043, 5047, 5048, 5049, 5057, 1392, 1393, 1394, 1395, 1396, 1398, 1399, 1400, 1401 and 1402.) When EPA rejected the request for alternative dispute resolution, Rockwell took the unusual step of seeking the assistance of Members of the House of Representatives. (See Trial Exh. 1391.) Rockwell sought that assistance in order to help resolve a costly and acrimonious dispute with a governmental agency that appeared unwilling to consider Rockwell's perspective that agency data, statements, and

information were technically unsound. (See Trial Ex. 1400.) Two Members of the House of Representatives, Rep. Fred Upton and Rep. Sander Levin, wrote to EPA's Superfund Director and urged that EPA reconsider its refusal to engage in alternative dispute resolution measures for the Rockwell Site. (See Trial Exh. 1399.) EPA rejected that request from the Members and stated that additional ADR procedures would not be fruitful, citing this Court's findings after the Phase I trial. (Trial Exh. 1403.) Rockwell continues to take issue with the assertions of EPA, and has provided additional information to Congress. (Trial Exh. 1404.)

F-69. Rockwell's dispute with EPA at the Rockwell Superfund Site is based in part upon its consultants' belief that the EPA's own contractors had made errors of analysis with respect to the Rockwell Site. An example of this is the aerial photographic analysis performed for EPA by Lockheed in 1986, Trial Exhibit 1173. Lockheed's report included a disclaimer stating that the report had not been peer-reviewed and was not for distribution. Rockwell retained a consultant, which analyzed the photos and which submitted the analysis, Trial Exhibit 5054, for peer review by a professor at the University of Wyoming. The reviewer agreed with Rockwell's 3 interpretation of the photos. Rockwell's own analysis concluded that, for example, where Lockheed had interpreted the 1946 photo as showing an "unlined lagoon," it was actually showing a pile of coal or a stain. Lockheed interpreted an area in the 1946 photograph as "seepage" or "waste" in an area on the riverbank; Rockwell's analysis determined that it was cinder or asphalt placed there to stabilize the slope of the riverbank. Other areas in a 1951 photograph were interpreted by Lockheed as waste; Rockwell's analysis determined that they were smoke from the burning of trash in an adjacent landfill. Another example is particularly telling: Lockheed identified as "residue" some areas in a 1960 photograph that Rockwell's consultant determined matched other areas shown on an adjacent playground, and concluded that the feature was light-toned native soil. (Testimony of Barrick, Nov. 10, 1999, at 38-42. Trial Exh. 1173. Trial Exh. 5054.)

L-9. Such examples of misinterpretation by EPA consultants demonstrate why Rockwell's dispute with the EPA over the significance of historical and contemporary analysis

may be justified. Rockwell's disputes with the EPA are not evidence of lack of cooperation with the government in such a way as to endanger the environment or the public health.

F-70. Moreover, the activities at the Rockwell Site are not germane to the investigation and remediation of the Kalamazoo River. EPA told Rockwell not to investigate River sediments adjacent to its property and to contain its efforts to the Rockwell Site itself, which was the concern of EPA. Rockwell's property, originally listed as a Superfund Site in 1988, was not a PCB Site originally, despite the fact that the MDEQ (then MDNR) was well aware of the PCB problem in the River and had spent more than a decade investigating it at that point. Rockwell was not included as a PRP for the River when EPA listed the River as a Superfund Site in 1990. The information provided to the public by EPA and MDEQ concerning the River Site makes no mention of Rockwell as a potential contributor of PCBs to the River; the entire focus is on the paper recylcing industry. (See, for example, Trial Exh. 8810. Testimony of Shafer, Nov. 10, 1999, at 88-89, 107-111.)

F-71. In addition, Rockwell has provided expertise and assistance to EPA and MDEQ. For example, Rockwell's consultants were able to design a sampling and analytical technique for pond sediments that allowed a detection limit of 0.1 ppm, whereas prior to that time, EPA's technology did not allow them to detect amounts smaller than 35 ppm. That advancement by Rockwell provides benefit to MDEQ and EPA on other PCB sites as well as the Rockwell site. (Testimony of Shafer, Nov. 9, 1999, at 98-99. Testimony of Barrick, Aug. 13/14, 1998, at 17-21.) Rockwell submitted a proposal for an interim measure at the Rockwell site in 1998, and although more than a year has passed since the submission, EPA has not yet responded to the proposal. (Testimony of Shafer, Nov. 9, 1999, at 103-104.)

L-10. This Court concludes that there is no basis, legal or equitable, for considering in this case the cooperation (or not) of a PRP at a Site different from the one at bar. Even if such a consideration were relevant, however, this Court concludes that, in light of the circumstances (the dispute over the science to be used at the Rockwell Site and the factual supports claimed by EPA for its claims in the remedial investigation, the evidence regarding potentially inaccurate

interpretations of aerial photos by EPA contractors, and the efforts to resolve these issues), this Court will draw no conclusions about Rockwell's cooperation as a factor relevant to this contribution action.

### V. PLAINTIFF'S MEMBER COMPANIES

F-72. The KRSG members admit that waste containing detectable levels of PCBs have been released from their paper-making facilities to either Portage Creek or the Kalamazoo River within the NPL Site. (Admission: Plaintiff's Responses to Eaton and Rockwell's First Set of Requests for Admissions, dated June 3, 1997, Response Nos. 1, 2, 3, 5, 7, 9. Admission: Plaintiff's Responses to Pharmacia & Upjohn's First Request for Admissions, dated May 12, 1997, Responses 2 through 9. Admission: Plaintiff's Responses to Rock-Tenn Co., Mill Division, Inc's First Requests for Admissions, dated Aug. 11, 1997, Responses 2 through 9.)

F-73. Allied and Georgia-Pacific admit that PCBs released from their facilities have come to be located in the sediments of Portage Creek and the Kalamazoo River. Simpson and James River admit that evidence exists from which it can be inferred that PCBs released from their facilities have come to be located in the sediments of the Kalamazoo River. (Pleading: Plaintiff's Responses to Eaton and Rockwell's First Set of Requests for Admissions, dated June 3, 1997, Response Nos. 12, 13, 14, 15.)

F-74. The four members of plaintiff KRSG have operated paper recycling mills conducting recycling and deinking operations, adjacent to the Kalamazoo River or Portage Creek, within the NPL Site. Each of the mills owned by KRSG's members performed deinking or used de-inked feedstock at some point in the past. (Opinion: KRSG v. Rockwell, et al, Case No. 1:95-CV-838, Mar. 6, 1998, at 3.)

F-75. Deinking is a process used by paper manufacturers to produce higher quality papers from recycled feedstock. (Opinion: KRSG v. Rockwell, et al., Case No. 1:95-CV-838, Mar. 6, 1998, at 3.)

F-76. This Court has previously found that paper mills which practiced deinking discharged PCBs in much greater quantities than those that merely recycled paper. (Opinion: KRSG v. Rockwell, et al., Case No. 1:95-CV-838, Mar. 6, 1998, at 3.)

F-77. Allied, James River, Georgia-Pacific and Simpson have each contributed PCBs to the NPL Site in large quantities, on a frequent basis, as a result of their deinking and paper recycling operations. (Testimony of Brown, Cross-Examination, Aug. 10, 1998, at 112-43.)

F-78. Each of the Plaintiff's members utilized carbonless copy paper as a component in their recycled furnish (also known as feedstock). (Depositions: Hanson at 27-30 (Georgia-Pacific); Gilman at 29-31, 107-108 (Allied); Huisman at 24 (James River); Lawton at 72-75 (Simpson). Trial Exh. 8012, 8013: Brown Company memoranda.) Georgia-Pacific and James River, at various times, used feedstock consisting entirely or largely of NCR paper. (Opinion: KRSG v. Rockwell, et al, Case No. 1:95-CV-838, Mar. 6, 1998, at 3.)

F-79. PCBs from plaintiff's members' mills have been detected in their residual sludges and in their effluent. (Admission: Pltf's March 4, 1998, Response to Rockwell Facts, ¶11.)

F-80. An expert retained by Georgia-Pacific Corporation, Richard Valley, prepared a report in 1990, estimating amounts of PCBs discharged by the paper mills during the period from 1960 to 1979. According to the Valley Report, Allied discharged between 895.000 and 1,790,000 pounds of PCBs to the NPL Site, Georgia-Pacific discharged between 560,000 and 1,120,000 pounds, James River discharged between 512,000 and 1,025,000 pounds from one of its three facilities, and Simpson discharged between 254,000 and 507,000 pounds of PCBs to the NPL Site. (Trial Exh. 8804: Valley Report at KB203-00497 to -00498.)

F-81. The PCBs contributed by these four paper companies to the NPL Site have migrated downstream over time. (Opinion: KRSG v. Rockwell, et al., Case No. 1:95-CV-838, Mar. 6, 1998, at 2. Testimony of Brown, Cross-Examination, Aug. 10, 1998, at 62.)

F-82. In 1997, the Michigan Department of Environmental Quality estimated that approximately 350,000 pounds of PCBs are present at the NPL Site. (Trial Exh. 8810: March 1997 MDEQ Briefing Report.)

F-83. KRSG's expert, Dr. Brown, conceded that there were substantial quantities of PCBs in the River attributable to KRSG's members. Although it is not surprising that his estimate is more conservative than those of the MDEQ or Richard Valley, Dr. Brown recently calculated the volume of PCBs to be approximately 120,000 pounds in the riverbed from Portage Creek downstream. He also admitted that, taking into account the roughness of the estimate, the range of volume of PCBs could be from 60,000 to perhaps 240,000 pounds. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 107-108.) Dr. Brown's estimate does not include the nearly three million cubic yards of PCBs present in KRSG's residuals in landfills and historical lagoons, many of which are a continuing source of new PCBs to the River and Creek. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 108-109.)

F-84. The evidence presented at trial (in the form of deposition testimony, documents compiled by plaintiff's environmental consultant Blasland Bouck & Lee, expert testimony of defendants' expert Mr. Barrick, and evidence adduced from plaintiff's expert Dr. Mark Brown on cross-examination) supports in a credible and persuasive way the conclusion that plaintiff's member companies contributed massive amounts of PCBs to the NPL Site, the Kalamazoo River and Portage Creek. Plaintiff's principal expert, Dr. Mark Brown, conceded that the Michigan Department of Environmental Quality has found that the PCB contamination in the Site comes from the paper industry. He conceded that it is likely that most of the Aroclor 1242 found in the River came from the paper recycling industry. (Testimony of Brown, Cross-Examination, Aug. 10, 1998, at 91-92.) He also conceded that plaintiff's residuals (i.e., the PCBs containing waste in the operable units, some of which continues to erode and leak into the River today) is in excess of one million cubic yards, and "probably a little less than" three million cubic yards. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 109.) As Dr. Brown told a citizens group several years ago, the residuals alone would fill the Pontiac Silverdome 1½ times. (Idl.)

F-85. Plaintiff presented no persuasive or credible evidence contradicting the conclusion that the KRSG is responsible for releasing massive quantities of PCBs to the Site.

F-86. USEPA has concluded, after investigation, that Allied's Bryant Mill Pond is the most important upstream source of PCBs to the River. (Trial Exh. 8813: USEPA Addendum to Action Memorandum.)

F-87. Based on the records and testimony available today, it appears that James River is the only member of plaintiff that consistently and systematically tested for PCBs in its product, waste and effluent.

F-88. Of the four KRSG members, Allied Paper was the largest manufacturer and during the 1950's and 60's operated the largest waste paper deinking operation in the world. (Trial Exh. 8236. Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 136-37.) Allied and Georgia-Pacific conducted deinking and paper recycling operations on an even larger scale than did James River, but these companies did not consistently test for PCBs. (Trial Exh. 8235: Allied Paper Omnibus.)

F-89. Based on the presence of elevated concentrations of PCBs in the paper residuals removed from the clarifiers of Allied, Georgia-Pacific, James River and Simpson and disposed of in landfills within the NPL Site, it can be reasonably inferred that the corresponding effluent from those KRSG members' clarifiers contained PCBs attached to suspended solids within that effluent, which was discharged to the Kalamazoo River and Portage Creek. This is evidenced, for example, by a comparison of PCB levels in clarifier influent, effluent and paper residuals (vacuum filter solids) from the Brown (James River) Company clarifier. (Testimony of Barrick, Aug. 13/14, 1998, at 118-21. Trial Exhs. 8008, 8015, and 8016: Brown Co. lab reports, comparing PCB levels in clarifier influent, effluent and paper residuals/vacuum filter solids.)

F-90. Plaintiff's expert agreed at trial that a variety of Aroclors, not just Aroclor 1242, was detected in the residuals of at least three of the four paper companies. Those Aroclors include 1016, 1242, 1248, 1254, and 1260. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 120 (Allied); 128, 130-31, 133-34 (Georgia-Pacific); 132 (Simpson).) Testing by MDNR in 1987 at the James River Facility disclosed Aroclors 1248 and 1254 in the company's

landfill residuals, and Aroclors 1242 and 1254 in its outfall to the Kalamazoo River. (Trial Exh. 8023: MDNR Letter re James River sampling results.)

F-91. Testing of paper residuals in the Allied Operable Unit, Georgia-Pacific's Willow Boulevard/A-Site and King Highway Landfills, and Simpson's 12th Street Landfill by KRSG's environmental consultants (Blasland, Bouck & Lee and Geraghty & Miller) confirms that each of these locations contains multiple detections of Aroclors 1254 and 1260 in addition to Aroclor 1242. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 120, 128, 130-31, 132, 133-34. Trial Exh. 8719: Draft Tech. Memo 7, Table 3-10. Trial Exh. 8738: Tech. Memo 9, Table 3-11. Trial Exh. 8725: Tech. Memo 6, Table 3-9. Trial Exh. 8615: Tech. Memo 8, Table 3-8.) Testing by MDNR in 1987 of James River disclosed Aroclors 1248 and 1254 in the company's landfill residuals, and Aroclors 1242 and 1254 in its outfall to the Kalamazoo River. (Trial Exh. 8023: MDNR Letter re James River sampling results.)

# A. James River Paper Company

F-92. James River Corporation and its predecessors (KVP Sutherland and Brown Company) have operated two paper-making facilities along the Kalamazoo River since 1939. One is the Specialty Papers Division located in Parchment, Michigan ("Parchment Facility"). The second is a box board manufacturing plant in Kalamazoo ("Kalamazoo Mill"). The Kalamazoo Mill also operated a deinking facility for a period of years during the 1970s. (Uncontroverted Facts, ¶13. Depositions: Ferguson at 14-16; Nitz at 38-39.)

F-93. The Parchment Facility comprised two paper mills, plus a parchmentizing operation. (Uncontroverted Facts, ¶ 14. Trial Exh 8001: 1973 MDNR Industrial Waste Survey of James River, at 2.)

F-94. Wastewater from the Parchment Facility is discharged to the Kalamazoo River. From 1939 through the mid 1970's, all effluent from Mill No. 1 operations at the Parchment Facility was discharged directly to the Kalamazoo River without waste treatment. (Trial Exh. 8000: 1972 James River interoffice memo.)

- F-95. Prior to the mid 1970's, Parchment Mill No. 2 wastewater was discharged to the Kalamazoo River through a river weir after passing through a series of settling lagoons. A clarifier and sludge dewatering system was implemented at Parchment Mill No. 2 in the mid to late 1970's. (Deposition: Ferguson at 18.)
- F-96. The Kalamazoo Mill box board manufacturing plant used pulp made of 100% recycled waste paper as furnish in its operations (Deposition: Ferguson at 14-16.)
- F-97. For a period of years in the mid 1970's, the Kalamazoo Mill operated a deinking mill ("pulp mill") which supplied de-inked pulp for use at Parchment Mill No. 2. (Depositions: Ferguson at 14-16; Chadderdon at 14-15.) The pulp mill used primarily office waste paper, which contained NCR paper, as furnish for its operations. (Deposition: Nitz at 38-39.) A James River document indicates that, on at least two particular days, 100% of the furnish for James River's pulp mill was NCR paper. (Trial Exh. 8007: 1976 lab reports re James River effluent, at page KJ 01000022.)
- F-98. Prior to the late 1960's, treated wastewater from the Kalamazoo Facility was discharged to the Kalamazoo River. After the late 1960's effluent from the Kalamazoo Mill was discharged to the Kalamazoo Water Reclamation Plant. (Deposition: Zinkus at 19.)
- F-99. Beginning in the early 1970's, as a requirement of the U.S. Food and Drug Administration, James River began testing for PCB levels in its box board used for food packaging manufactured at the Kalamazoo Mill. James River performed daily PCB testing in its own laboratory using a gas chromatograph and a full time staff trained to perform PCB analysis. (Deposition: Huisman at 13, 16.)
- F-100. According to Dr. Huisman, director of James River's laboratory, PCBs were detected in nearly every sample taken of James River's box board during the early 1970s to mid-1970s. (Depositions: Huisman at 21-22; Nitz at 30-32. Trial Exh. 8022: 1981 letter attaching PCB data.)
- F-101. Beginning in the mid-1970's, James River tested for and confirmed the existence of PCBs in its (1) paper residuals from both the Kalamazoo and Parchment Mills (Trial Exh.

8015: 1976 lab report. Trial Exh. 8016: 1976 lab report. Trial Exh. 8020: 1979 letter. Trial Exh. 8018: 1977 memorandum); (2) pulp from the deinking mill (Trial Exh. 8003: 1975 lab reports. Trial Exh. 8009: 1976 lab report); (3) waste paper furnish used in box board production and the deinking mill (Trial Exhs. 8012, 8013: 1976 memoranda and lab reports); and (4) effluent to the Kalamazoo River at its Parchment Mill outfall (Trial Exh.

8004: 1975 and 1976 lab reports) and to the Kalamazoo Water Reclamation Plant from the Kalamazoo Mill (Trial Exh. 8005: 1975 and 1976 lab reports.)

F-102. In 1976, James River conducted a study to determine PCB concentrations in samples of white and colored ledger waste paper used as furnish in its deinking mill. Of the 24 samples taken, each contained PCBs, with levels as high as 9,605 ppm. (Trial Exhs. 8012, 8013: 1976 memoranda and lab reports.)

F-103. Frank Yankoviak, James River's Technical Director, stated in a memorandum describing the study of furnish for the mills: "These results indicate that there is a considerable amount of PCB's coming in through our waste paper furnish." (Trial Exh. 8013: 1976 memorandum at page KJ 00900020.)

F-104. PCBs were detected in James River's paper residuals (vacuum filter solids) at levels ranging between 12.7 and 125.7 ppm. (Trial Exh. 8015: 1976 lab report at page KJ 01000046-48. Trial Exh. 8016: 1976 lab report. Trial Exh. 8018: 1977 memorandum. Deposition: Huisman at 99-101, 122-24.) The paper residuals from both the Kalamazoo Mill and the Parchment Mill were deposited in James River's landfill at the Parchment Mill located near the Kalamazoo River. In 1987, the MDNR detected PCBs in soil/sludge samples from James River's landfill. (Trial Exh. 8023: 1987 letter, MDNR to James River, attaching PCB sampling data.)

F-105. PCBs were detected in the pulp generated at James River's deinking mill at levels ranging from a trace up to 110 ppm. (Trial Exh. 8009: 1976 lab report. Deposition: Huisman at 53-67, 43-49, 102-106.) PCB contaminated pulp from the deinking mill in

Kalamazoo was used in James River's Parchment Mill, which discharged its effluent to the Kalamazoo River. (Depositions: Ferguson at 14-16; Huisman at 54.)

F-106. On several occasions in 1975 and 1976, PCBs were detected in the James River Parchment Mill's effluent to the Kalamazoo River, measured at the river weir, at levels ranging from less than .1 up to 102.8 ppb. (Trial Exh. 8004: 1975 and 1976 lab reports. Trial Exh. 8006: Compilation of Brown Co. PCB data, including effluent data. Deposition: Huisman at 72-77.)

F-107. On several occasions in 1975 and 1976, PCBs were detected in the effluent from the James River Kalamazoo Mill to the City water reclamation plant, at levels ranging from less than 0.1 ppb up to 33.3 ppb. (Trial Exh. 8005, 8008, 8011, 8010. Deposition: Huisman at 54.) During this time period, PCBs were detected in the effluent from James River's deinking pulpmill to the city water reclamation plant at levels up to 606 ppb. (Trial Exh. 8006.) The City discharged its effluent to the River after an additional settling process, which was the only treatment used to remove PCBs from the City's effluent, and was not fully effective, based on the presence of PCBs in clarifier effluent.

F-108. Between 1975 and 1985, James River's engineering staff compiled a series of PCB test results documenting the high levels of PCBs in James River's production of paper products, paper residuals, pulp and effluent discharges. (Trial Exh. 8006: compilation of PCB data. Deposition: Zinkus at 170-75.)

## B. Allied Paper Company, Inc.

F-109. Allied operated three mills within the NPL Site: Bryant Mill, Monarch Mill and King Mill. These mills practiced deinking from the 1950s through 1971. (Uncontroverted Facts, ¶ 15. Trial Exh. 8715: Blasland, Bouck & Lee, Tech. Memo No. 15, p. 1-1. Admission: Pltf's March 4, 1998, Response to Rockwell Facts, ¶6.)

F-110. Annual reports and other documents recounting Allied's history state that Allied's Kalamazoo facilities ran the world's largest deinking operation. (Trial Exh. 8236: Allied Paper Omnibus at page KA 04600438. Deposition: Falvey at 91.) Deinking occurred at the

King Mill from at least the 1940's until 1960. The Bryant Mill practiced deinking from 1957 through 1971 and the Monarch Mill from the 1940's until 1960. (Trial Exh. 8715: BBL Tech. Memo No. 15, Mill Investigation at 1-3 to 1-6.)

F-111. Beginning in 1953, the Monarch clarifier effluent was discharged to Portage Creek upstream of Bryant Mill Pond. (Deposition: Falvey at 11.) Beginning in the mid-1950's, the Bryant clarifier was also discharged to Portage Creek upstream of Bryant Mill Pond, but in the early 1970's was rerouted to the City's treatment plant. (Deposition: Falvey at 39-40, 42-43.) Throughout its operation, the King clarifier effluent was discharged to the Kalamazoo River through the King Highway storm sewer. (Deposition: Falvey at 27-30.)

F-112. A December 31, 1958, Allied interoffice memorandum states with regard to the King Mill waste treatment system:

"We are in flagrant violation of our Michigan Water Resources Commission Orders on the amount of waste that we may discharge into the Kalamazoo River. Presently and for some time now, we have done little or no effective settling of our mill wastes. The system has been in operation with the only thing happening being power usage."

With regard to the Bryant Mill, the same memorandum stated: "the main problem in operation [of the system] is the periodic bypassing of the highly loaded deinking waste directly to Portage Creek." (Trial Exh. 8204: 1958 Allied interoffice memo.)

F-113. An April 25, 1958, Allied interoffice memorandum states:

"The King settling tank during the past year (1957-58) has been down from 13-20% of the operating days due to mechanical and operational trouble. During the 313 operating days, the mill effluent was not treated 31 days due to sludge pump trouble. For 30 days (for a few hours to 24 hours) the system was down due to repair and unclogging of the continuous bar grate cleaner."

(Trial Exh. 8203: 1958 interoffice memorandum.)

F-114. Allied waste treatment system performance data states that in 1961, Allied discharged 156,494 pounds per day of suspended solids to the Kalamazoo River and Portage Creek. (Trial Exh. 8232: chart of suspended solids.) This data only reflects discharges from

the clarifiers. Suspended solids in waste waters that were bypassed directly to Portage Creek or the Kalamazoo River are not included in this data.

- F-115. During the entire time that deinking occurred at Allied, and afterward, Allied experienced periodic breakdowns and other problems with operation of its various waste treatment systems. Periodic bypasses of untreated waste from deinking operations occurred at each of the mills. Periodically, from the 1950's through the 1970's, MDNR staff and other witnesses observed bypasses of untreated wastes into Portage Creek and Bryant Mill Pond and observed the Pond itself to be a milky white color. (Trial Exhs. 8222, 8202, 8214, 8209, 8208, 8207, 8205.)
- F-116. Allied has not produced any PCB test results of effluent prior to 1971, the time period when deinking or recycling of waste paper was occurring in the Allied Mills.
- F-117. In 1973, after deinking and waste paper recycling activities had ceased, the MDNR detected PCBs at a concentration of 6.9 ppb in the Bryant clarifier's effluent discharged to the City's treatment plant. (Trial Exh. 8213: 1973 letter, MDNR to Allied.)
- F-118. PCBs were detected in Allied's Monarch clarifier discharge to Portage Creek in 1985 and 1986. (Trial Exh. 8225: 1987 table of PCB results.)
- F-119. Allied stated in an information sheet issued to its employees, which discussed the PCB contamination in Bryant Mill Pond: "The deinking process produced waste. Unknown to Allied, at times that waste contained PCB traces from the dyes used in making carbonless copy paper. Allied sent that waste through its own in-plant wastewater treatment system, which consisted of clarifiers, or large settling tanks . . . . The only known source of PCBs in the effluent stream -- some of which escaped the clarifiers and were discharged into Portage Creek -- were the carbonless paper dyes, and perhaps a small amount from PCBs in printing inks." (Trial Exh. 8224: 1987 cover letter and "Backgrounder.")
- F-120. Remedial Investigation data generated or gathered by plaintiff KRSG's environmental consultants shows that, in 74 surficial samples throughout the Bryant Mill Pond, the average PCB concentration is 110 ppm. In 222 subsurface samples in the pond sediments,

the average PCB concentration is 63 ppm. (Trial Exh. 8719: Draft BBL Tech. Memo No. 7, Allied Paper, Inc. Operable Unit, at 35. Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 117-119.)

F-121. A known release of PCBs from Bryant Mill Pond occurred in 1976 when Allied lowered the pond and the impounded water and its sediment load were permitted to escape over the dam and downstream into the Kalamazoo River. Over a three week period, Portage Creek turned a gray-black color from pond sediments that were churned up and transported over the dam during the lowering process. During this time period, Portage Creek water samples showed PCB levels ranging between 92.7 to 292 ppb in the water traveling over the Alcott Street Dam toward the Kalamazoo River. (Trial Exh. 8216: Letter, Allied to MDNR, at page \$A 006771. Testimony of Brown, Cross-Examination, Aug. 11, 1998 at 122.)

F-122. When the Bryant Mill Pond was lowered in 1976, the presence of paper residuals was evident and the pond bottom was gray in color. (Depositions: Falvey at 135; Harvey at 133; Brooks at 97-98; Cornelius, Sept. 8, 1997 at 36-37.)

F-123. Because of the continuing risk to human health and the environment, in September 1999, USEPA completed a time-critical removal action, removing 150,000 cubic yards of PCB contaminated Bryant Mill Pond sediments within Portage Creek containing approximately 10 tons of PCBs. This was nearly double the amount of paper waste and PCBs expected to be found when USEPA began the removal action. (Trial Exhs. 8812 and 8813: USEPA Action Memorandum and Addendum re Removal Action. Deposition: Cornelius, Oct. 12, 1999 at 15-20.)

F-124. Over one million cubic yards of PCB-contaminated paper sludge are present in various disposal areas and historical sludge de-watering lagoons of the 51-acre Allied OU, located in an area adjacent to Portage Creek. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 114.) Paper residuals in the (1) Bryant and Monarch Mill residual de-watering lagoons, (2) Type III paper sludge landfill, (3) western disposal area, and (4) Portage Creek floodplain and sediments contain varying levels of PCBs. (Trial Exh. 8719: Draft BBL Tech.

Memo No. 7, Allied Paper Operable Unit, at 59. Deposition: Cornelius, Sept. 8, 1997 at 36-37, 81.)

F-125. PCB concentrations in Allied's Type III landfill were as high as 2000 ppm. (Trial Exh. 8719: Draft BBL Tech. Memo No. 7, Allied Paper Operable Unit, at 34. Deposition: Cornelius, Sept. 8, 1997 at 74.)

F-126. PCB releases to the NPL Site have been confirmed in leachate seeps and surface water drainage within Allied's sludge disposal areas. (Trial Exh. 8027 / 8233: "Results of Allied Paper, Inc. Program to Monitor PCBs in the Isolated Flow Areas." Trial Exh. 8218: 1976 MDNR Industrial Waste Water Survey. Deposition: Cornelius, Sept. 8, 1997 at 97-98.) Groundwater at the Allied Operable Unit is contaminated with PCBs and continuously vents to Portage Creek. (Deposition: Cornelius, Oct. 12, 1999, at 24.)

F-127. Remedial Investigation data shows that in addition to Aroclor 1242, Aroclors 1016, 1248, 1254 and 1260 are also present in paper residuals in the various disposal areas located about the Allied Operable Unit. (Trial Exh. 8719: Draft BBL Tech. Memo No. 7, Allied Paper, Inc. Operable Unit, Table 3-10. Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 120-21. Deposition: Cornelius, Sept. 8, 1997 at 84-86.)

F-128. In addition to releases of PCBs caused by deinking operations, there is evidence of PCB releases from other sources at Allied. During an inspection by USEPA contractors in 1981, PCB-containing transformers were found to be leaking at the Allied facilities. As a result, Allied paid civil penalties for violations of the Toxic Substance Control Act. (Trial Exh. 8220: 1981 Versar Report on PCB Inspection of Allied's facility. Trial Exh. 8221: 1982 EPA Complaint re same.)

### C. Georgia-Pacific

F-129. Georgia-Pacific's mill in Kalamazoo, located on King Highway, practiced deinking from the 1950s to the present. (Trial Exh. 8715: BBL Tech. Memo No. 15, p. 1-1. Admission: Pltf's March 4, 1998, Response to Rockwell Facts, ¶7.)

- F-130. The Valley Report, which was commissioned by Georgia-Pacific, states that, based on company records, Georgia-Pacific de-inked up to 200 tons of waste paper per day. Georgia-Pacific ranked behind only Allied Paper in terms of the size of its deinking operations in the Kalamazoo River Valley. (Trial Exh 8804: Valley Report)
- F-131. Carbonless copy paper was used in Georgia-Pacific's deinking operations, and bales of NCR paper were required in the formula for the de-inked and recycled pulp used for paper making. (Deposition: Hanson at 27-30.)
- F-132. In 1954, a primary treatment clarifier was installed at the Georgia-Pacific Mill, which discharged waste water to the Kalamazoo River for 10 years until 1964. After this time, the effluent from Georgia Pacific's clarifier was sent to the Kalamazoo Waste Water Treatment Plant. (Trial Exh. 8715: BBL Tech. Memo 15, Mill Investigation, at 1-1 and 1-2.)
- F-133. During most of the 1950's, Georgia-Pacific's paper residuals were pumped from the clarifier to adjacent sludge de-watering lagoons located along the River. In the late 1950's, the King Highway de-watering lagoons were constructed on the opposite side of the Kalamazoo River and paper sludge, at two to four percent solids, was pumped across the river via pipeline for de-watering in the unlined lagoons. (Trial Exh. 8715: BBL Tech. Memo 15, Mill Investigation, at 1-1 and 1-2.)
- F-134. Paper sludge was periodically excavated from the de-watering lagoons and disposed of at the Willow Boulevard landfill until 1975, when the landfill reached capacity. From 1975 to 1987, the paper sludge was disposed of at the landfill known as the Willow Boulevard/A-Site (an area formerly operated by Allied as de-watering lagoons). After this time, sludges were disposed of at the King Highway Landfill, a landfill created over the top of the old Georgia-Pacific de-watering lagoons. (Trial Exh. 8715: BBL Tech. Memo 15, Mill Investigation, at 1-1 and 1-2.)
- F-135. The Willow Boulevard/A-Site is a landfill owned and formerly operated by Georgia-Pacific located on the banks of the Kalamazoo River. The A-Site was previously a series of sludge dewatering lagoons used by Allied's King Mill before being covered over by

Georgia-Pacific's paper residuals. The Willow Boulevard landfill was created through Georgia-Pacific's disposal of PCB-contaminated paper residuals, directly into the Kalamazoo River and in a swampy area adjacent to the River. (Deposition: Cornelius, Oct. 12, 1999, at 26-31.) There is no visible berm or storm water collection system at the Willow Boulevard Landfill. PCB-contaminated paper residuals have been identified in areas throughout the landfill and extend into the Kalamazoo River adjacent to the Landfill. PCB-contaminated paper residuals continuously erode from Willow Boulevard Landfill into the Kalamazoo River. (Trial Exh. 8738: BBL Tech. Memo 9, Willow Boulevard/A-Site Operable Unit. Depositions: Cornelius, Sept. 8, 1997 at 26-29, 102-114; Cornelius, Oct. 12, 1999 at 26-31.)

F-136. The King Highway Landfill, located along the Kalamazoo River, is owned and operated by Georgia-Pacific. Underlying this landfill are sludge dewatering lagoons formerly utilized by Georgia-Pacific in earlier years. PCB-contaminated sludges have been identified in areas throughout the landfill. Prior to the placement of a steel wall between the landfill and the River, PCB-contaminated paper residuals eroded into the River at the King Highway Landfill. (Deposition: Cornelius, Oct. 12, 1999 at 34.) PCB-contaminated paper residuals are located in the King Highway storm sewer on the west boundary of the landfill, and extend into the Kalamazoo River. Evidence indicates that these PCB-contaminated residuals in the river originated from Allied's King Mill which utilized the storm sewer for its waste water discharges. The PCB-contaminated paper mill discharges from the King Highway storm sewer formed a paper sludge "delta" extending into the Kalamazoo River. The volume of these residuals is well over 33,000 cubic yards and contain up to 190 ppm PCBs. (Trial Exh. 8715: BBL Tech. Memo 15, Mill Investigation, at 2-5. Trial Exh. 8725: BBL Tech. Memo 6, King Highway Landfill Operable Unit, at 29 through 31, Table 3-9. Deposition: Cornelius, Oct. 12, 1999, at 35-38.)

F-137. In 1996, an investigation of the presence of PCBs was conducted at the Georgia-Pacific Mill. PCB concentrations up to 110 ppm were detected in the former lagoon areas next to the old Georgia-Pacific clarifier. The Aroclors detected in these paper residuals included 1016,

1242, 1248, 1254 and 1260. PCBs were also detected in sediment from Georgia-Pacific's storm water drainage system, which discharges to the Kalamazoo River. PCBs were also detected in a remnant of waste water from the old Georgia-Pacific clarifier. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 133. Trial Exh. 8715: BBL Tech. Memo 15, Mill Investigations, at 3-1 and 3-2.)

F-138. The average concentration of PCBs in paper residuals located on the surface of the Willow Boulevard Landfill was 88 ppm. The maximum concentration was 270 ppm. (Trial Exh. 8738: BBL Tech. Memo 9, Willow Boulevard/A-Site Operable Unit, at 24.)

F-139. The average concentration of PCBs in subsurface samples at the A-Site was 55 ppm with a maximum of 330 ppm. (Trial Exh. 8738: BBL Tech. Memo 9, Willow Blvd/A-Site Operable Unit, at 24.)

F-140. PCB-contaminated paper residuals are present in the Kalamazoo River adjacent to the Willow Boulevard Landfill. (Deposition: Cornelius, Sept. 8, 1997 at 26, 103-104.

Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 126.)

F-141. Various Aroclors have been detected at the Willow Boulevard/A-Site including 1016, 1242, 1248, 1254, and 1260. (Trial Exh. 8738: BBL Tech. Memo 9, Willow Boulevard/A-Site Operable Unit, Table 3-11. Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 133.) The King Highway landfill contains Aroclors 1254 and 1260, as well. (Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 130-31.)

to the Willow Boulevard Landfill is 44 ppm with an average of 11 ppm. (Trial Exh. 8738: BBL Tech. Memo 9, Willow Boulevard/A-Site Operable Unit, at 25. Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 126.)

F-142. The maximum PCB concentration in paper residuals present in the River adjacent

F-143. There is no stormwater berm at Willow Boulevard landfill, and therefore PCB-contaminated residuals in the landfill are a continuing source of PCBs to the Kalamazoo River as evidenced by 1900 cubic yards of paper waste located in the River adjacent to the landfill.

(Testimony of Brown, Cross-Examination, Aug. 11, 1998, at 126, 127-28. Deposition: Cornelius, Sept. 8, 1997 at 26. Trial Exh. 8738: BBL Tech. Memo 9 at 25, 39.)

F-144. In 1999, Georgia Pacific excavated PCB-contaminated waste from five former sludge lagoons on its mill property including waste in a flood plain adjacent to the lagoons that extended into the Kalamazoo River. Georgia Pacific excavated the PCB-contaminated waste down to the River edge, but refused to excavate paper waste present in the River. Georgia Pacific also failed to excavate PCB-contaminated paper residuals located in the river off of the King Street storm sewer. (Deposition: Cornelius, Oct. 12, 1999 at 41-43, 46-47. Testimony of Brown, Nov. 10, 1999, at 58-59.)

F-145. Georgia-Pacific produced no effluent PCB data while deinking occurred and while effluent was discharged to the Kalamazoo River. However, the presence of PCBs in residuals in the Willow Boulevard Landfill (which received PCB-contaminated residuals during the time period when Georgia-Pacific discharged clarifier effluent to the Kalamazoo River) gives rise to the reasonable inference that PCBs were present in that effluent to the River. (Testimony of Barrick, Aug. 13/14, 1998, at 117-21.) In addition. Georgia-Pacific has admitted discharging PCBs from its Kalamazoo Mill. (Admission: Plaintiff KRSG's Responses to Eaton and Rockwell's First Set of Requests for Admissions Directed to Plaintiff, dated June 3, 1997, Response 5.)

# D. Simpson-Plainwell Paper Company

F-146. Simpson-Plainwell Paper mill practiced deinking from 1910 through 1962 at its Plainwell, Michigan, mill. During this time period and afterward, Simpson's clarifier effluent was discharged to the Kalamazoo River. (Trial Exh. 8715: BBL Tech. Memo No. 15, p. 1-2. Admission: Pltf's March 4, 1998, Response to Rockwell Facts, ¶8.)

F-147. Various types of waste paper were recycled at the Simpson mill, including office paper. One employee conducted an internal inquiry into the use of NCR paper after the MDNR began its investigation of PCB contamination in the river. He concluded that substantial amounts of NCR paper were recycled at the mill. (Deposition: Lawton at 72-75.)

F-148. Deinking was conducted by Simpson on a large scale. A document summarizing waste disposal practices through 1960 refers to a range of deinking volumes of 300 to 900 tons per month with suspended solids discharges to the river averaging 14,000 to 34,000 pounds per day. (Trial Exh. 8600: Report on waste disposal, 1947 to 1960.)

F-149. No effluent tests for PCBs exist from the time period when deinking occurred at Simpson; however, a 1973 MDNR Industrial Waste Water Survey detected .13 ppb PCBs in the Simpson clarifier's effluent discharge to the River. This detection of PCBs occurred 10 years after deinking operations ceased at the facility. (Trial Exh. 8602: 1973 Wastewater Survey at p. KS 01400001.)

F-150. Annual waste water reporting forms filled out by Simpson for the Michigan Water Resources Commission during the 1970's, which reflect estimates of discharges of critical materials from Simpson's outfalls to the Kalamazoo River, indicate annual discharges of PCBs ranging from less than 11 pounds to between 11 and 100 pounds. (Trial Exhs. 8617 & 8619: WRC Wastewater Outfall Reports.)

F-151. From the early 1950's through the early 1980's, Simpson used the 12th Street Landfill, located adjacent to the Plainwell Dam on the Kalamazoo River, for disposal of its paper residuals. The fill material was deposited down a hillside into a natural depression which immediately adjoined the River and a swampy area. As a result, paper residuals are currently present in the swampy area, in the floodplain of the River and in the River itself. (Trial Exh. 8616: MDEQ July 1997, Proposed Plan Fact Sheet, 12th Street Landfill. Testimony of Brown, Nov. 10, 1999, at 59-61.) PCB-contaminated residuals continue to erode into the River from the 12th Street Landfill through wind erosion and in areas where the river is in direct contact with paper sludge. (Deposition: Cornelius, Oct. 12, 1999 at 49-51.)

F-152. PCBs have been detected in paper residuals located in areas throughout the Twelfth Street Landfill. No consistent berm or storm water collection system existed at the landfill. At some point a berm was constructed around the perimeter of the fill area of the 12th Street Landfill. The berm is constructed of paper residuals along with sand and gravel. Some

PCB-contaminated sludges have been identified on the outside of the berm, on the banks of the Kalamazoo River and into the wetland area adjacent to the landfill. (Depositions: Cornelius, Sept. 8, 1997 at 30-33, 119-128; Lawton at 63-72. Trial Exh. 8611: 1989 letter re PCB testing of landfill. Trial Exh. 8615: Geraghty & Miller Tech. Memo 8, 12th Street Landfill Operable Unit, at 3-12 to 3-13, 6-1 to 6-2, Table 3-8. Trial Exh. 8616: MDEQ, July 1997, Proposed Plan Fact Sheet, 12th Street Landfill Operable. Testimony of Brown, Aug. 11, 1998, at 132.)

F-153. The presence of PCBs in Simpson's paper residuals at the 12th Street Landfill gives rise to the reasonable inference that PCBs were also present in Simpson's clarifier effluent to the Kalamazoo River. (Testimony of Barrick, Aug. 13/14, 1998, at 119.)

# VI. LIABILITY OF PLAINTIFF AND ITS MEMBER PAPER COMPANIES

L-11. This Court is persuaded that substantial quantities of PCBs were contributed by plaintiff's four member paper companies to the NPL Site, the Kalamazoo River and Portage Creek, and that those quantities are more than sufficient to justify imposing on plaintiff and its members the entire costs of response activities relating to the NPL Site, the River and the Creek.

# VII. ALLOCATION TO ROCKWELL

L-12. This Court concludes that the amounts of PCBs contributed by Rockwell to the Kalamazoo River, if any, are of such a small quantity as to be negligible. There is no credible and persuasive evidence indicating that such contributions rise above the background level of PCBs already in the River; the Court is persuaded by the evidence presented by Rockwell indicating that no discharges from the Rockwell property can be identified or detected in the River. For this reason and for the reasons articulated in this Opinion, this Court has concluded that the equitable share that should be allocated to Defendant Rockwell for the Kalamazoo River Site is zero.

Respectfully submitted,

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Dated: December 3, 1999

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# **ENVIRONMENTAL STRATEGIES CORPORATION**

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# HISTORICAL ACTIVITIES RECONSTRUCTION REPORT FORMER ROCKWELL INTERNATIONAL CORPORATION ALLEGAN, MICHIGAN SITE

# PREPARED FOR

MERITOR AUTOMOTIVE, INC. TROY, MICHIGAN

# **PREPARED**

 $\mathbf{BY}$ 

# **ENVIRONMENTAL STRATEGIES CORPORATION**

MARCH 31, 1998

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## Introduction

This document has been prepared, on behalf of Meritor Automotive, Inc. (Meritor), <sup>1</sup> to present a focused summary of the history of the former Rockwell International Corporation (Rockwell), Allegan, Michigan facility (Site) (Figure 1) and adjacent areas as it relates to potential environmental conditions. The interpretations presented herein are based on information that was recently obtained and information presented in the Remedial Investigation Report<sup>2</sup> prepared pursuant to the requirements of an Administrative Order on Consent (AOC) issued by U.S. Environmental Protection Agency Region V (USEPA).<sup>3</sup>

Meritor believes that the information presented herein will be useful in focusing the scope of the FS and the anticipated remedial actions at the Site.

Specifically addressed in this document are:

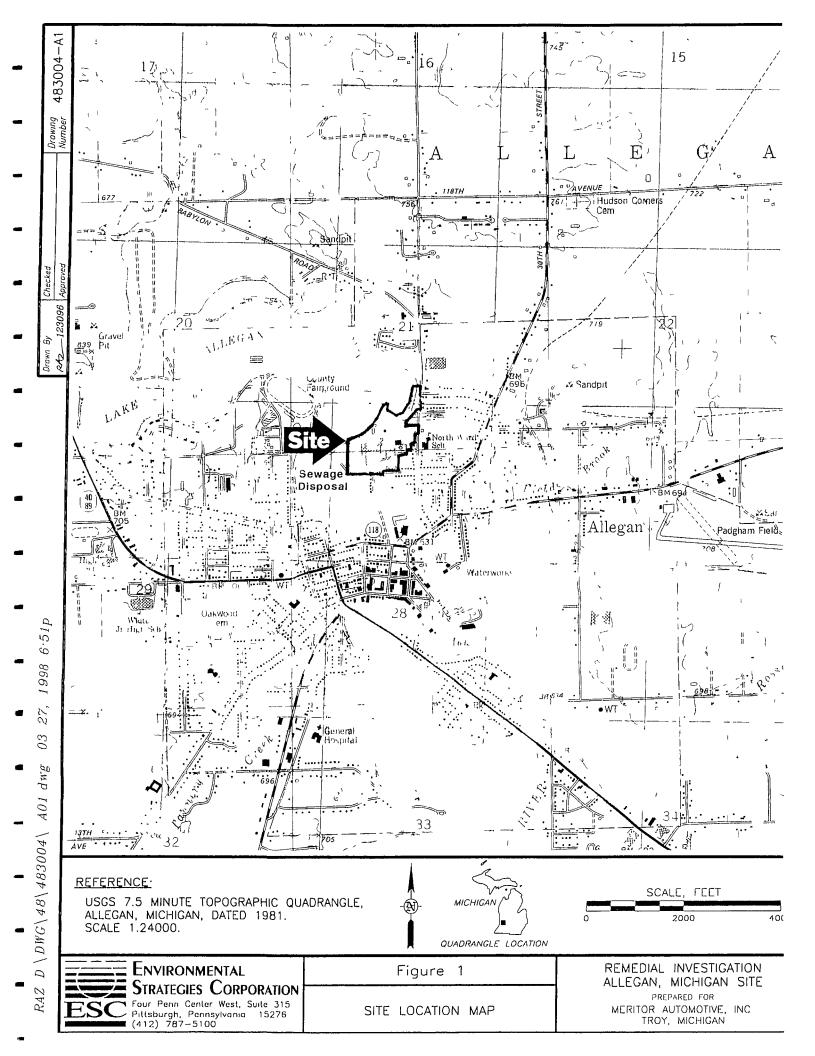
- the former Rockwell facility
- the City of Allegan publicly-owned treatment works (POTW) and landfill
- the backwater areas that were immediately proximate to the Rockwell facility.

The document is divided into six time periods, as follows:

- Before 1938
- 1938 to 1950
- 1951 to 1960
- 1961 to 1969
- 1970 to 1974
- After 1974

The development and evolution of specific aspects of environmental interest are also summarized, including:

- handling of oily wastewater at the former Rockwell facility
- development of the former Rockwell facility and city property
- presence of polychlorinated biphenyls (PCBs) in environmental media samples



Before 1938

## Before 1938

Conditions in the vicinity of the Site in circa 1935 are shown in Figure 2.4

## General

- The peninsula of land located on the inside of a meander of the Kalamazoo River was largely vacant or used for agricultural purposes until the early 1900s. Some areas were residential.<sup>5</sup>
- The Pére Marquette Railroad Company purchased a portion of the area of interest in 1901 and constructed a rail spur that bisected the area between 1903 and 1908. The line was later operated by Michigan Railway Engineering Company, Lake Shore and Michigan Southern, and ultimately by the Chesapeake and Ohio Railway Company (C&O).
- An earthen dike was present around most of the peninsula from at least 1931.
- Electrical power to the area is believed to have been initially provided by Consumers Power Company. In 1936, the City of Allegan also began to generate electrical power for consumers in the area.<sup>8</sup> In May 1937, Standard Steel Spring Company agreed to purchase power from the city.<sup>9</sup> Dielectric fluids containing PCBs may have been used in the utility's electrical transformers, although this is not likely during this time period.<sup>10</sup>

# Former Rockwell Facility

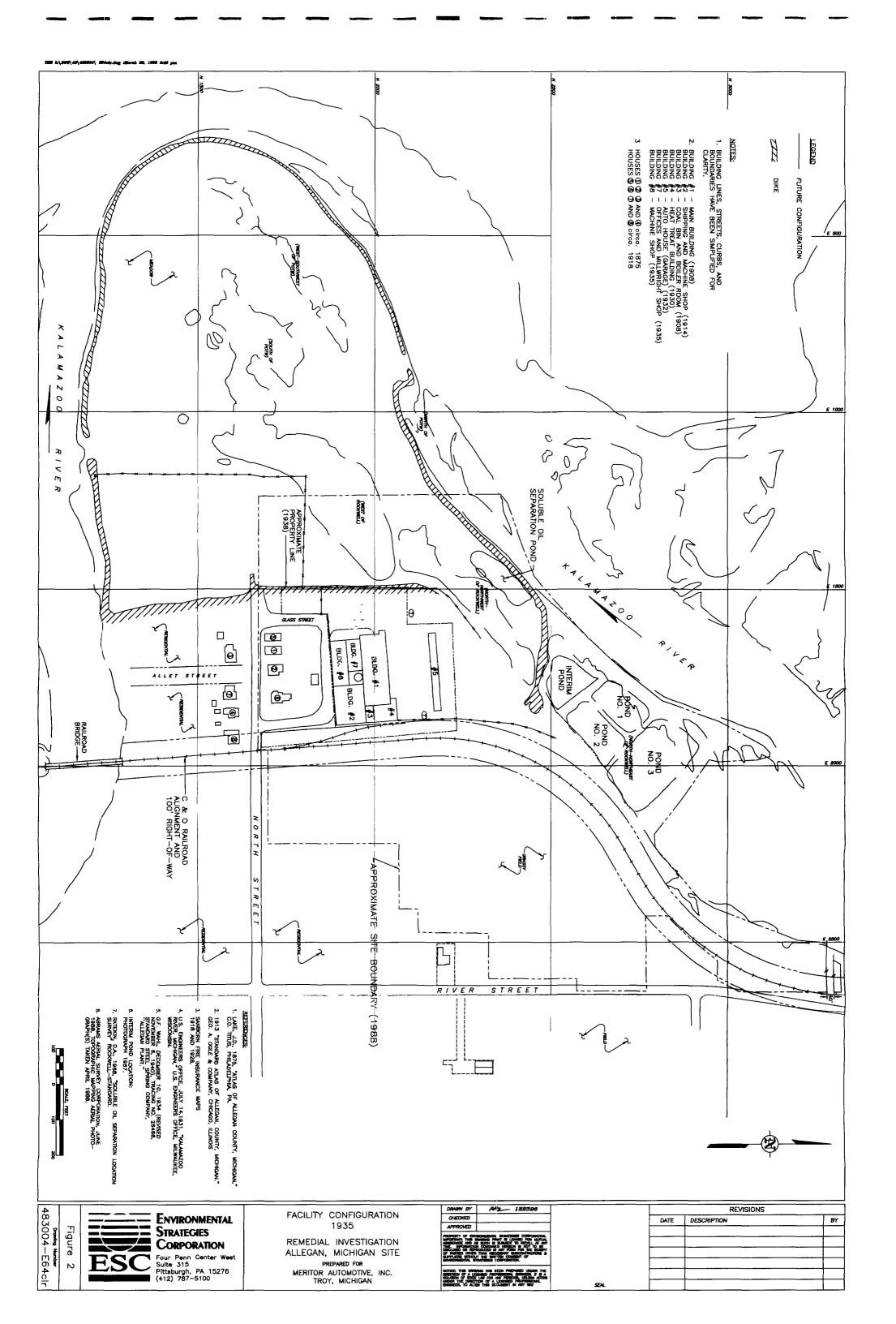
- The Allegan Mirror and Plate Company, which manufactured art glass and mirrors, purchased a portion of the Site in the early 1900s. The first buildings at the facility were constructed in 1908. 11
- Blood Brothers Machine Company (Blood Bros.) purchased the facility in 1914. Blood Bros. produced universal joints and automobiles, for several years beginning in 1915. 12
- Blood Bros. dissolved and merged into the Standard Steel Spring Company, in 1936. Universal joints were the principle product manufactured. <sup>13</sup>
- Operations at the facility through 1938 are believed to have included the heat treating (annealing) and machining of steel and parts assembly. Annealing did not require chemical treatment. Machining required the use of cutting oils; the cutting oils would not have contained PCBs. Heat treating was performed via oil quenching beginning in the 1920s; case-hardening using cyanide-salt baths may also have been performed during this time period.
- There is no documentation regarding the handling of oily wastewater at the facility during this period. During the 1930s (if not before), it is believed that the oily waste effluents (which were of a "small amount") and cooling water were collected in floor drains. The floor drains subsequently conveyed these fluids to the facility's storm water drains (that also collected runoff from the plant roofs) and thence to the Kalamazoo River or its backwaters.<sup>17</sup>
- Owen-Arnold and, subsequently, Excel Manufacturing Company operated at the corner of the rail spur and North Street from circa 1913 to circa 1941.

#### City of Allegan POTW

• The City of Allegan purchased the western portion of the peninsula in 1920. No municipal or industrial activities are believed to have occurred in this area until approximately 1938.

#### **Backwater Areas**

No information has been found showing the backwater conditions before 1938.<sup>20</sup>



1938 to 1950

Conditions in the vicinity of the Site in 1938, 1947, and 1950 are shown in Figures 3, 4, and 5. Photographs documenting conditions for this period include Photographs 1938, 1946ca, 1946, 1947, and 1950.<sup>21</sup>

## General

- Land use was generally consistent with that observed in the previous period. The configuration of the former Rockwell facility changed, the buildings at the corner of North Street and the rail spur were abandoned, the POTW was constructed, and a portion of the city property was developed as a landfill.
- The earthen dike, though disturbed by the construction of the POTW, continued to be visible around most of the peninsula through 1947.<sup>22</sup> (The dike remains intact in some areas to the present day.<sup>23</sup>)

# Former Rockwell Facility

- The assembly of drive lines is believed to have begun. Operations included heat treating and machining of steel and parts assembly.<sup>24</sup> Heat treating operations during this period included annealing and oil quenching; these processes continued until manufacturing operations at the facility ceased.<sup>25</sup> Casehardening, using cyanide-salt baths, is known to have been performed until 1947.<sup>26</sup>
- The plant's waste oil was recycled and sold. Oil clinging to parts was removed via a water wash process. The resulting mixture of water and oil became the oily process water effluent. The facility's process water effluent and cooling water were discharged, via an existing storm water system to the Kalamazoo River or its backwaters. Expansion of the facility during this period resulted in an increase in waste effluents. An oil/water separation system (Oil Flotation House) was constructed in 1945, as approved by the state, to remove oil from the wastewater effluents. After separation, the water discharged to the city's storm water catch basin on North Street and, subsequently, to the river via the storm water drainage pipe. Oil collected in the separator was periodically sold, pumped off by outside contractors, and taken offsite. 29
- Four electrical substations were present outdoors at the facility during this period.<sup>30</sup>
  - The substation north-northeast of the facility was replaced circa 1940, due to expansion of the facility, and a new unit (east substation) was constructed between the rail spur and the facility.
  - A substation was present west of the facility in the 1930s. A larger substation (located slightly to the north and west) replaced this substation circa 1946. The new west substation also apparently supplied power to the POTW.<sup>31</sup>

The electrical equipment in both of the new substations was likely to have used dielectric fluids containing PCBs

- Meritor has identified the following items of interest in the photographs for this period:<sup>32</sup>
  - areas of dark-toned soil: <sup>33</sup> (1) north and northwest of the facility; (2) proximate to the east substation; (3) on the rail spur east of the Oil Flotation House; and (4) immediately west of the west substation.
  - areas of light-toned native soil 34
  - area of miscellaneous waste (trash) placement north of the facility.<sup>35</sup>

# City of Allegan POTW

- The Works Progress Administration (WPA) began construction of the City of Allegan POTW in 1938.<sup>36</sup> The system is believed to have been complete and operational in 1940.<sup>37</sup> The POTW's original outfall is generally consistent with its current outfall.<sup>38</sup>
- Between 1947 and 1950, the city began to use a portion of their property north of North Street (including backwater areas) for the operation of a landfill.<sup>39</sup> (See Backwater Areas, below).

#### **Backwater Areas**

There were six backwater areas in the vicinity of the former Rockwell facility in 1938. Only the changes to the three areas immediately adjacent to the Rockwell facility (west, north-northwest, and north-northeast) are discussed.<sup>40</sup>

- The west area was separated from the facility by the existing dike and a section of land over 100 feet wide in 1938. This area was only partially inundated by 1947 and was subsequently used for landfilling circa 1950.41
- The north-northwest area was separated from the west area by the dike in 1938. These areas were in limited communication with each other through at least 1950. 42
- The north-northeast area was open to the Kalamazoo River. This area was separated from the north-northwest area by the existing dike circa 1931 to circa 1947.<sup>43</sup> Water within these areas was in limited communication circa 1947 to after 1950.<sup>44</sup>

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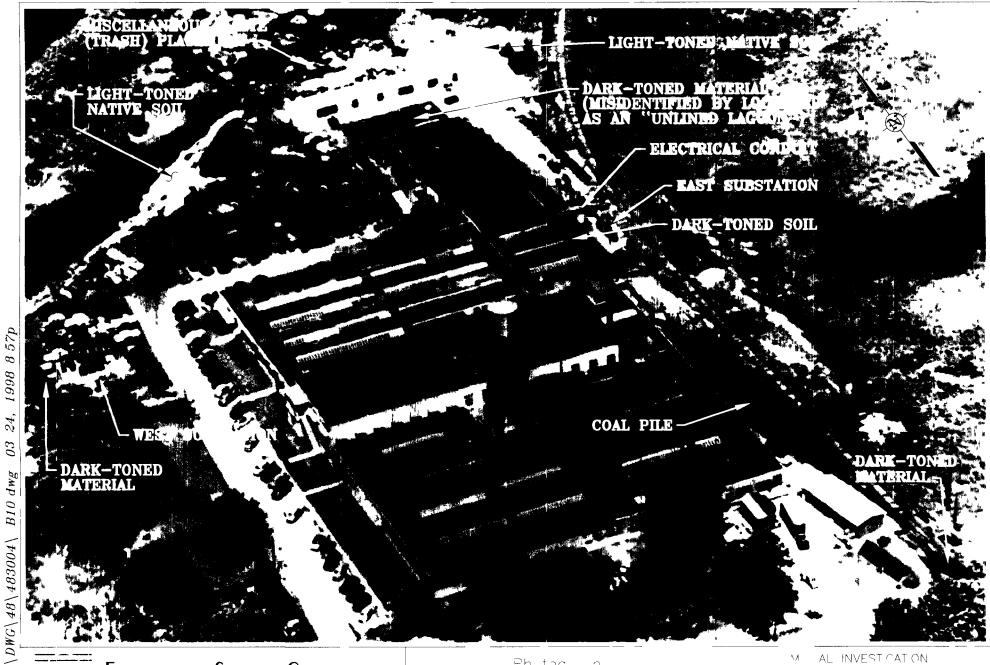
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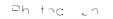
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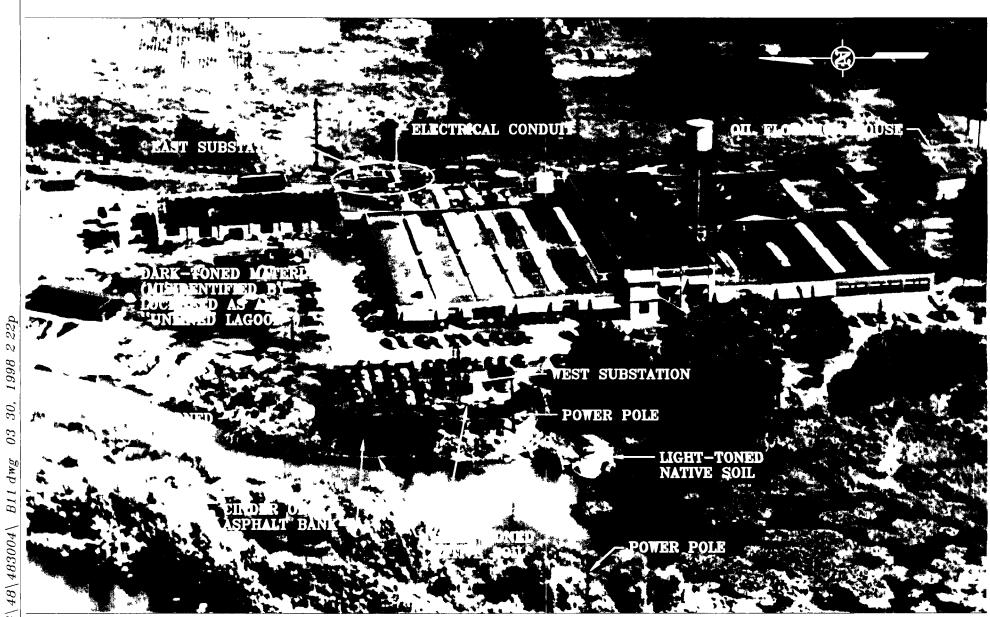


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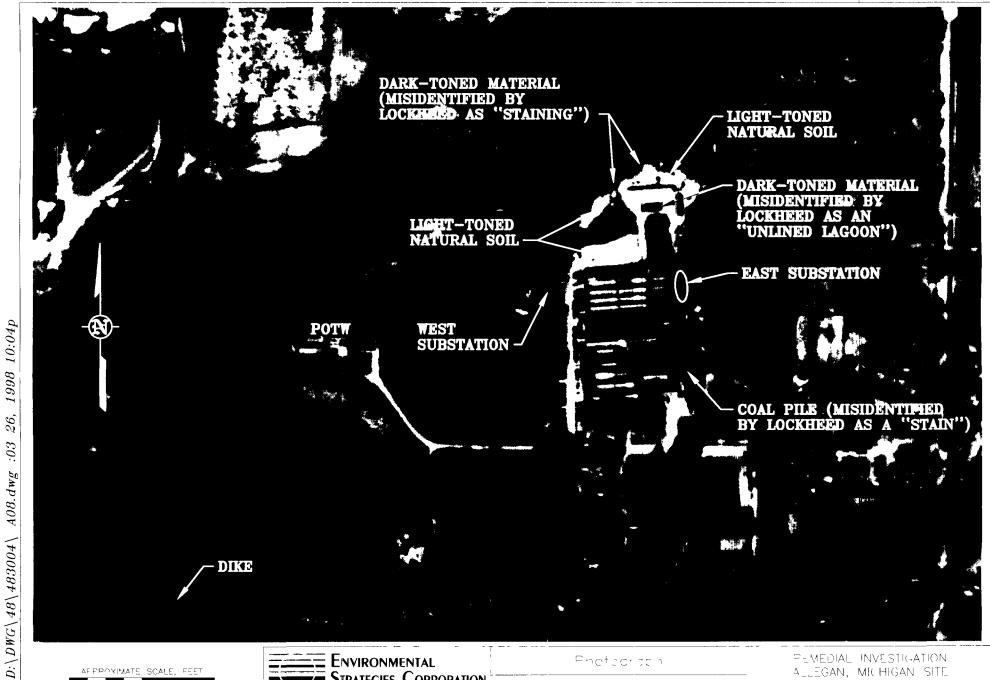
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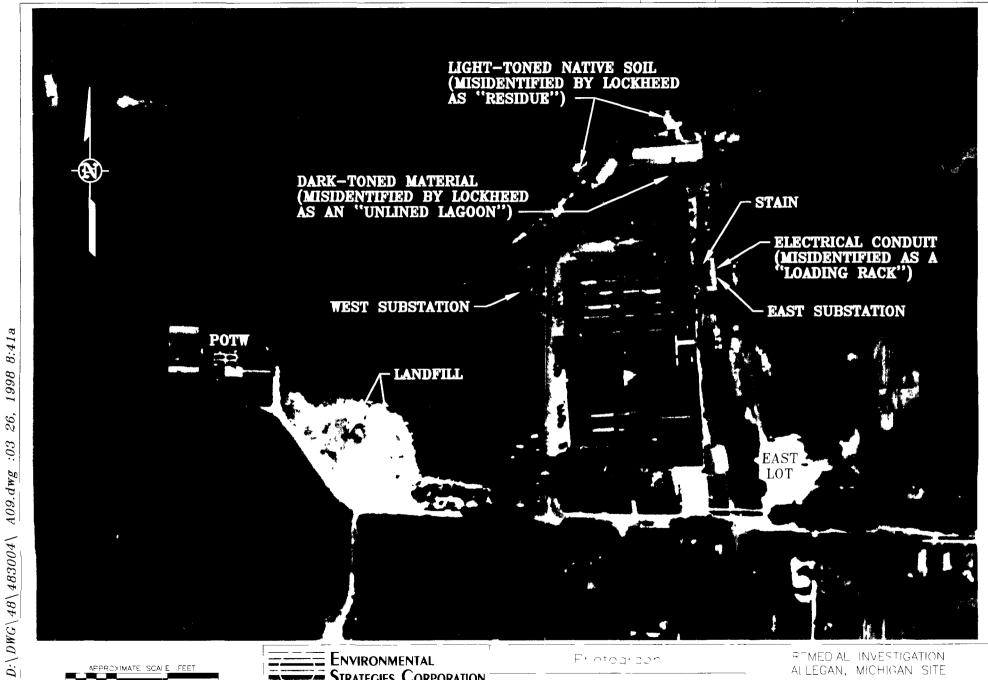




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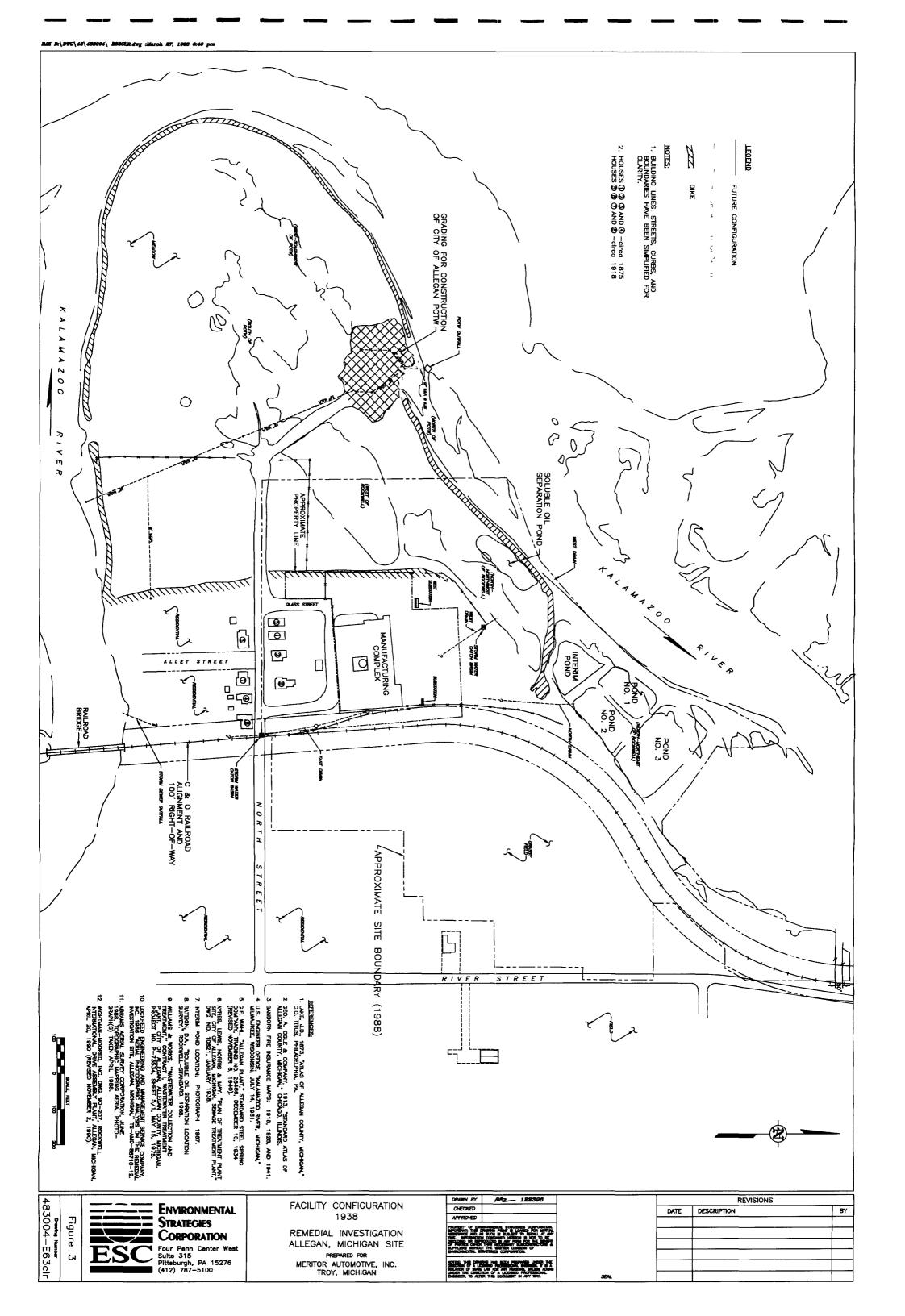
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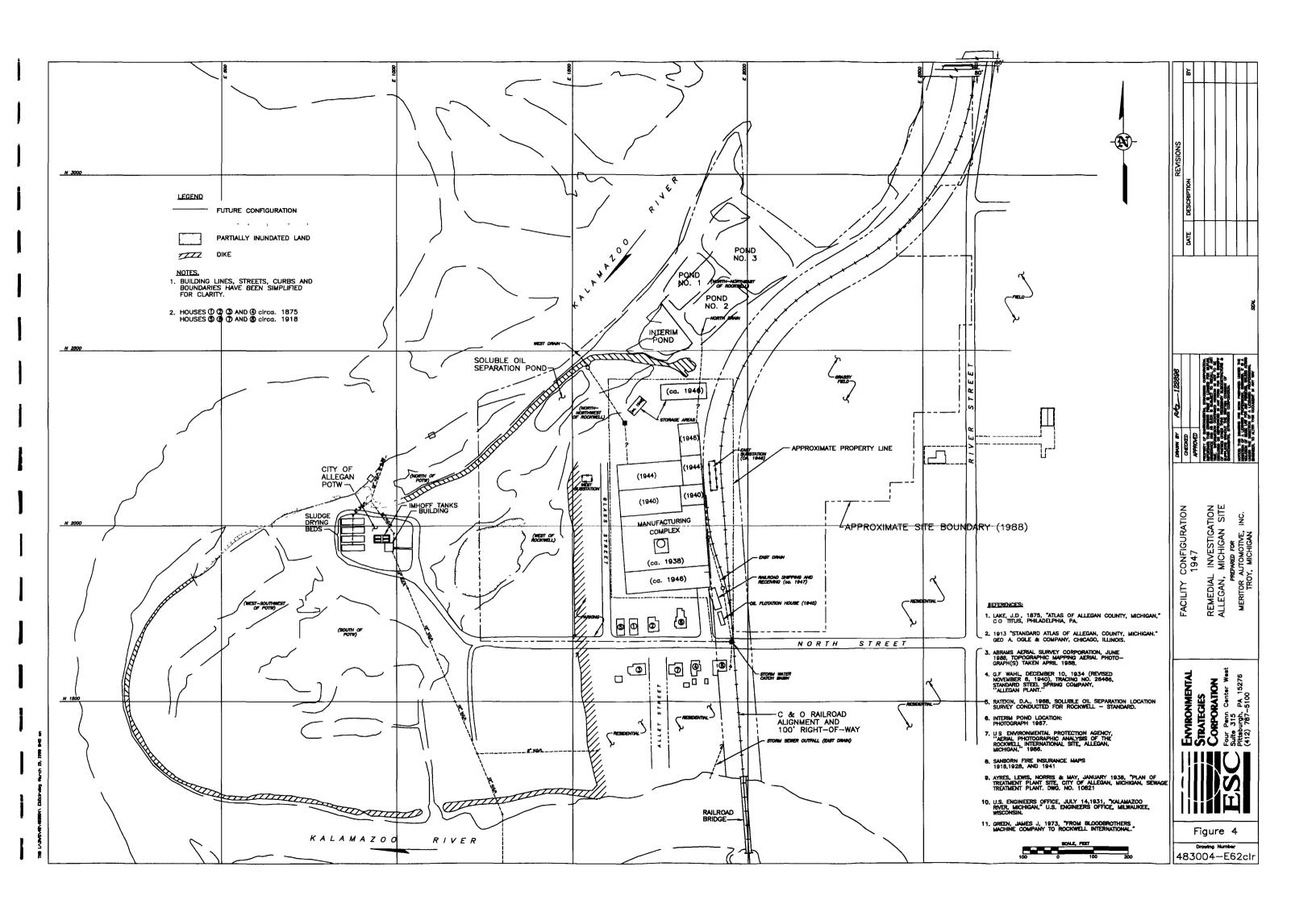
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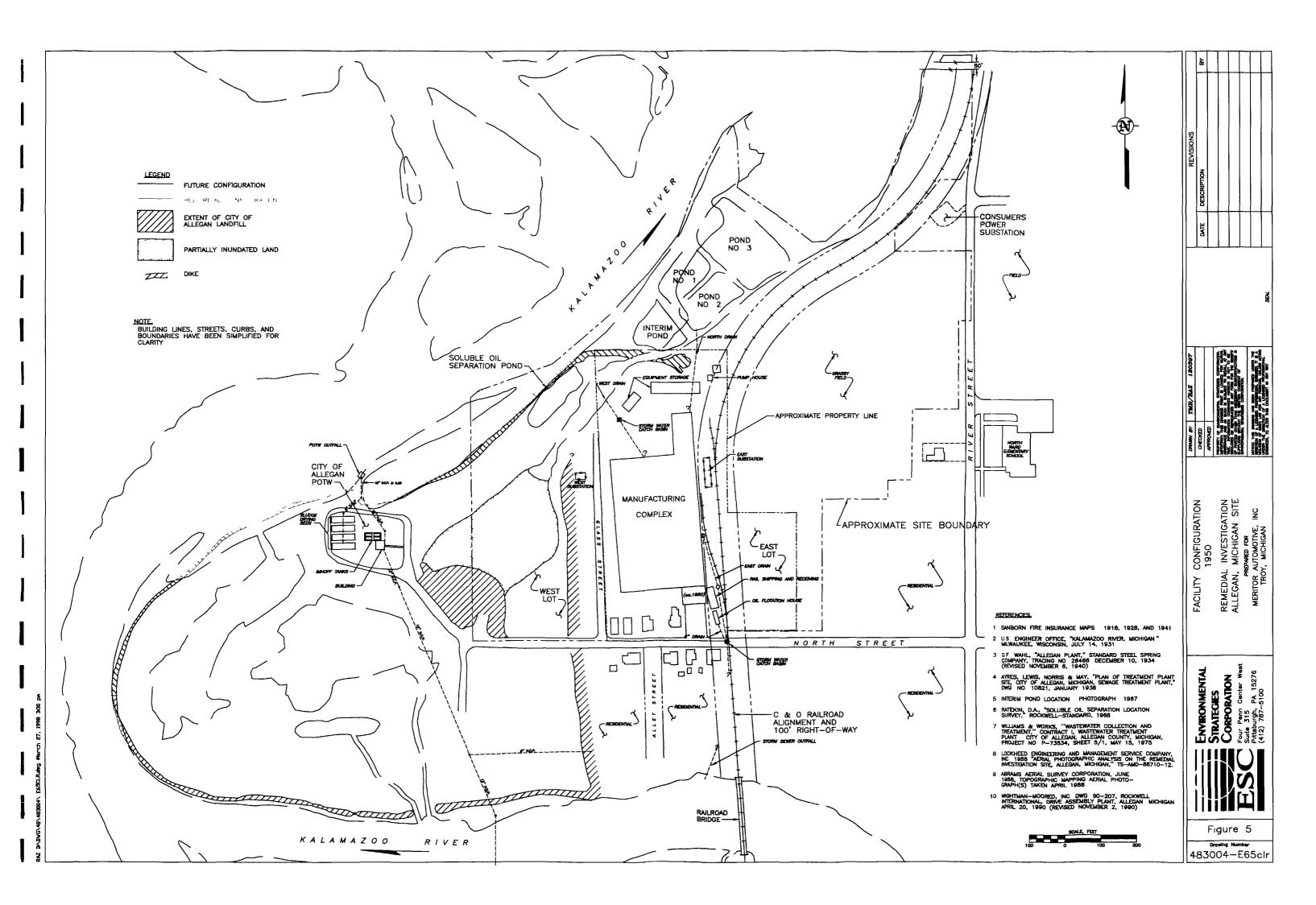
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REMEDIAL INVESTIGATION ALLEGAN, MICHIGAN SITE PREPARED FOR

MERIOR AUTOMOTIVE INC TROY MICHIGAN







1951 to 1960

## 1951 to 1960

Conditions in the vicinity of the Site in 1955 and 1960 are shown in Figures 6 and 7. Photographs documenting conditions for this period include Photographs 1951, 1955, 1957, and 1960.

#### General

• Land use was generally consistent with that observed in the previous period. Expansion at the former Rockwell facility included building additions to the south (circa 1955), the north (circa 1951 and 1956), and the northwest (1957)<sup>45</sup> and development of parking areas east and west of the facility.

# Former Rockwell Facility

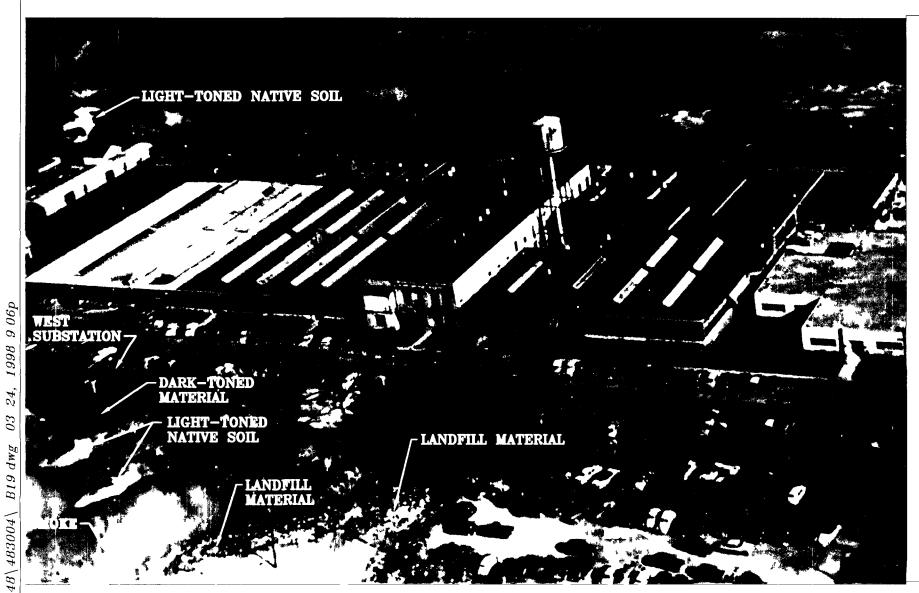
- Standard Steel and Spring became the Rockwell Spring and Axle Company in 1953.
- The facility continued to manufacture universal joints and assemble drive lines. Operations included heat treating (annealing, quenching, and nitriding), machining, and parts assembly.<sup>47</sup>
- Oily wastewater continued to be handled in the same manner as in 1945 to 1950.<sup>48</sup>
- The employee parking lot west of the facility (West Lot) was expanded over a portion of the city's landfill. The parking lot east of the rail spur (East Lot) was developed.<sup>49</sup>
- The west substation, constructed circa 1946, was decommissioned circa 1955.<sup>50</sup> It is likely that both the west substation and the remaining east substation had electrical equipment that used dielectric fluids containing PCBs.
- Meritor has identified the following items of interest in the photographs for this period:<sup>51</sup>
  - areas of dark-toned soil:<sup>52</sup> (1) on the rail spur east of the Oil Flotation House; (2) between the east substation and the facility; and (3) on the building complex pad north and northwest of the facility
  - areas of light-toned native soil<sup>53</sup>
  - areas of miscellaneous waste (trash) placement at the north of the facility.<sup>54</sup>

## City of Allegan POTW

- The City of Allegan POTW appeared to continue to operate in the same manner as described previously.
- The configuration of the city's landfill changed during this period. The landfill materials were periodically burned off.<sup>55</sup> The backwater area west of Rockwell was used by the city for landfilling; the city deeded a portion of the area to Rockwell in 1956 to facilitate expansion of the West Lot.<sup>56</sup> (See Backwater Areas, below.)

## Backwater Areas 57

- The area west of the facility, that was partially inundated in 1950, was used by the city for landfilling by 1955 and no longer existed as a backwater area. The eastern portion of this area was subsequently developed and used as Rockwell's West Lot.
- The area north-northwest of the facility was limited to a small pond by 1955 and no longer existed by 1957. A small area of ponded water was present in 1960.
- The area north-northeast of the facility was open to the Kalamazoo River.

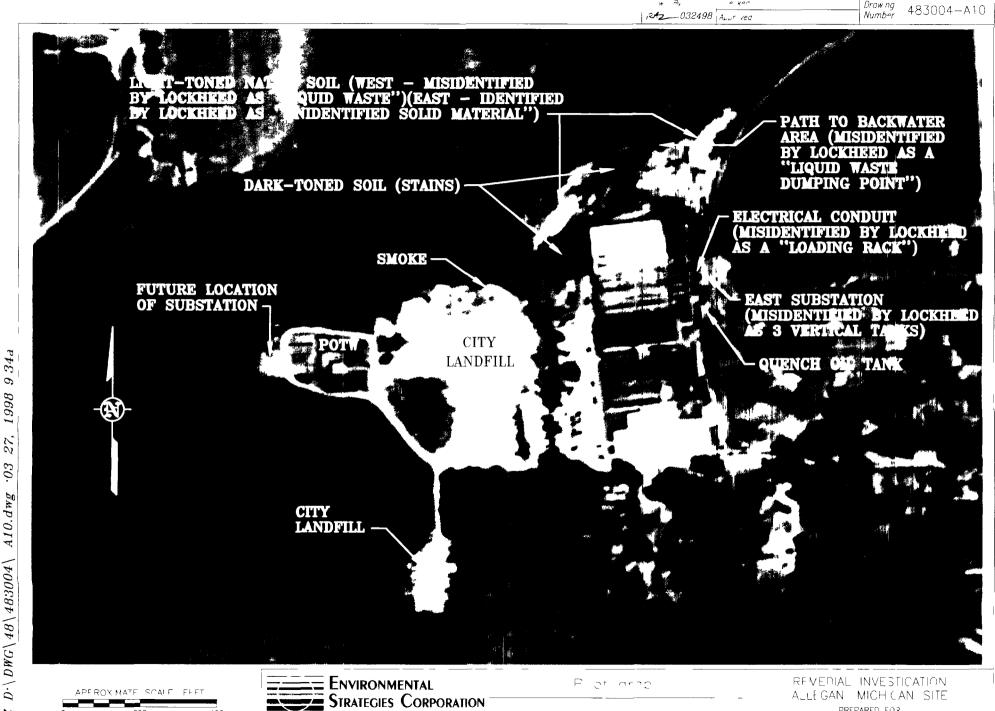




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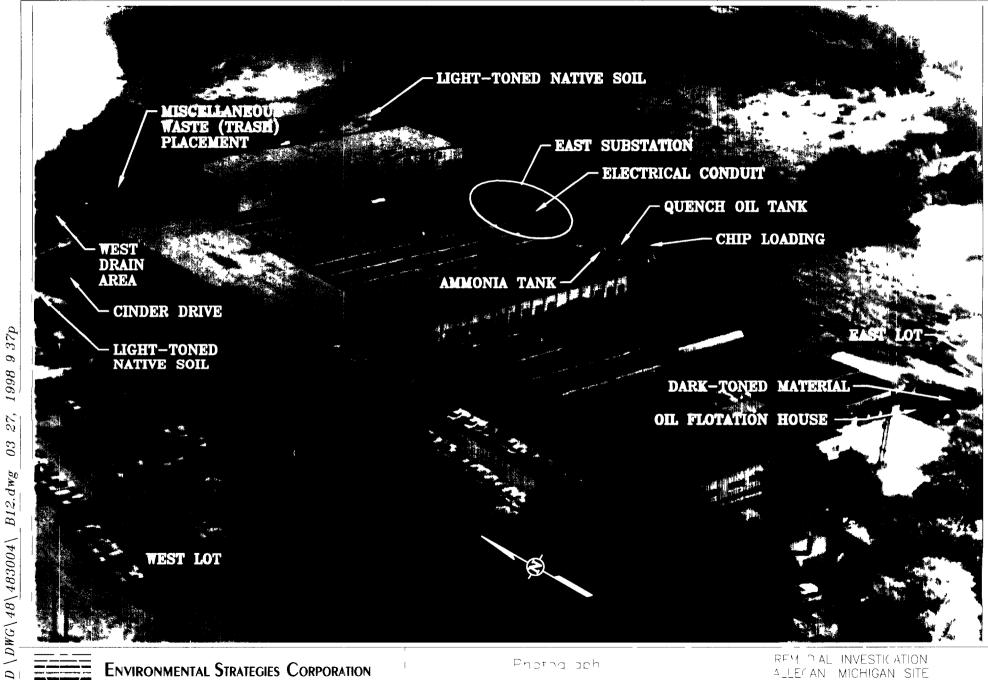
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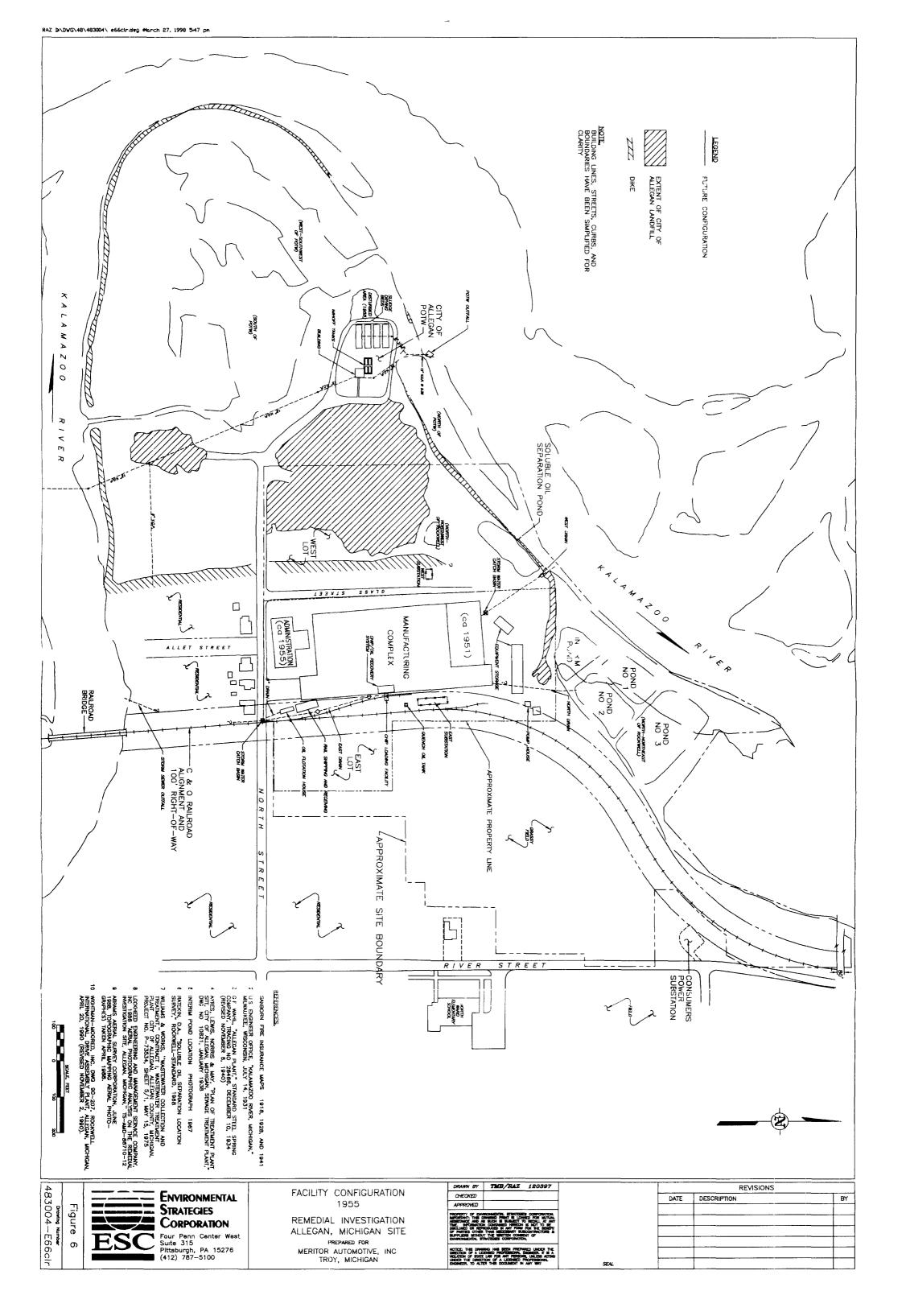


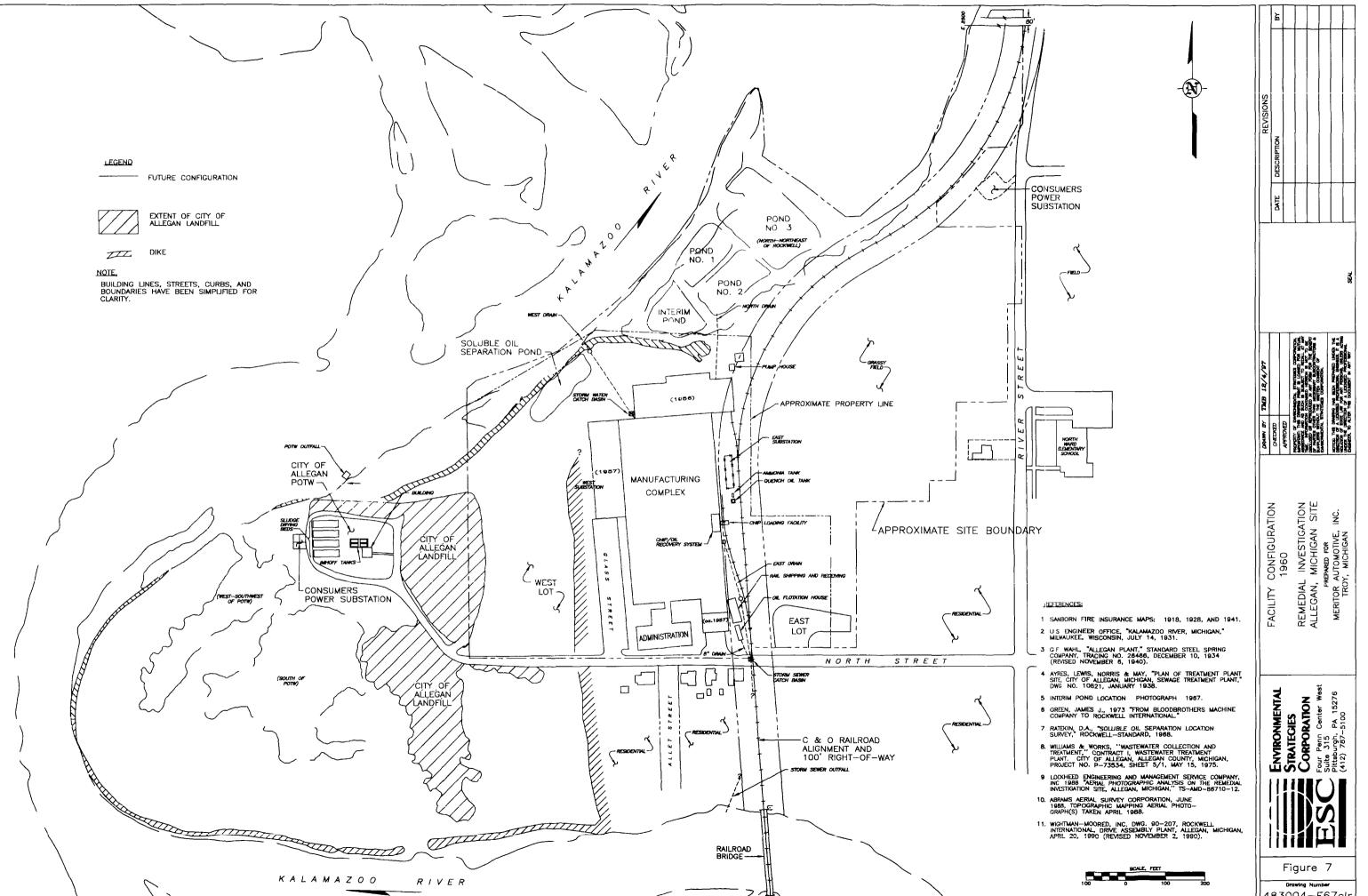
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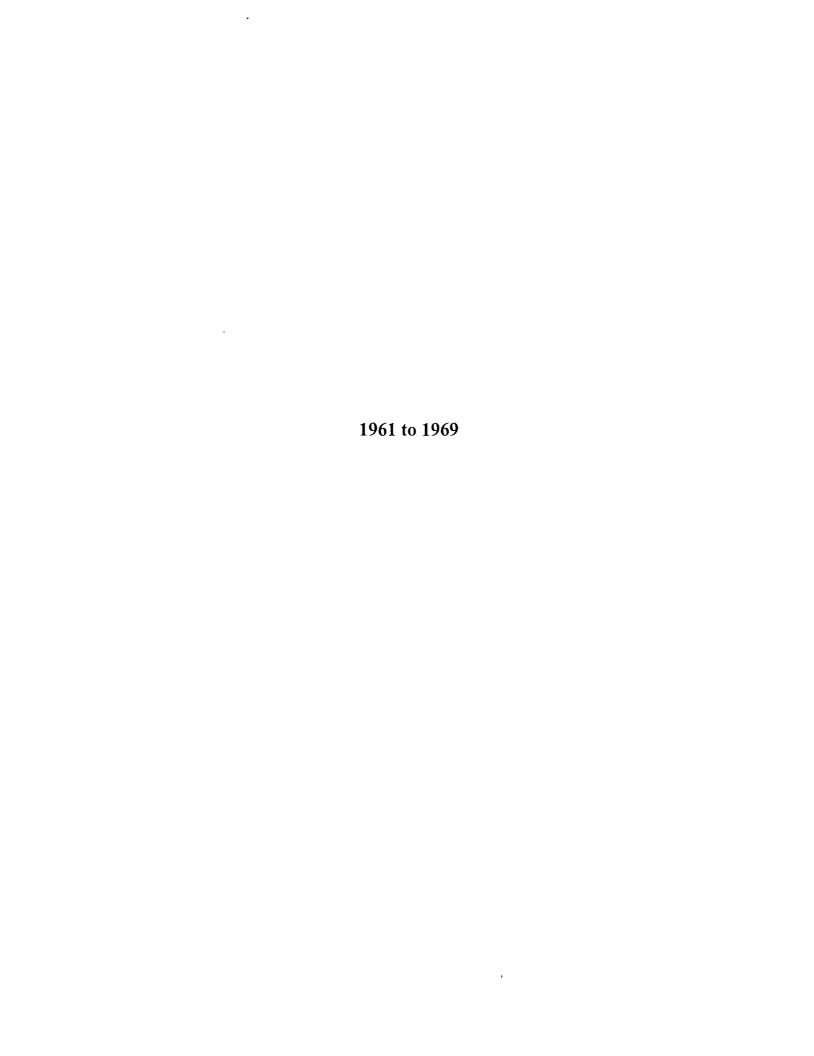
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## 1961 to 1969

Conditions in the vicinity of the Site in 1964, 1967, and 1969, are summarized in Figure 8. Photographs documenting conditions for these dates are provided as Photographs 1964, 1967, and 1969. 58

#### General

- Land use was consistent with that observed in the previous period. Expansion at the former Rockwell facility included building additions in 1963, 1964, 1965, and circa 1969. 59
- In February 1968, the City of Allegan sold its electric generating systems to Consumers Power Company. 60 The city's property south of North Street is believed to have been deeded to the power company at that time.

## Former Rockwell Facility

- The facility operations during this period were consistent with the previous period. 61
- Oily wastewater continued to be handled in the same manner as in 1951 to 1960, through 1964. In 1964, the Soluble Oil Separation (SOS) Pond was constructed north-northwest of the facility to handle soluble oil wastes, for which the Oil Flotation House was not designed.<sup>62</sup> Rancid, soluble machining oil was collected directly from the equipment into small "pump carts" which were wheeled outdoors<sup>63</sup> and the oil drained into the pond.<sup>64</sup> Periodically, oil that had separated at the surface of the pond was burned off.<sup>65</sup> Fill material was placed along the existing dike between the pond and river in 1966 and 1967.<sup>66</sup>
- Rockwell developed a new wastewater treatment system in the mid-1960s.<sup>67</sup> This period coincided with expansion of the facility to the north. The SOS Pond was subsequently closed by placing fill in the pond from west to east, with concurrent excavation and progressive "pushing" of the pond east to its final location (i.e., the Interim Pond).<sup>68</sup> Only the Interim Pond, which handled the facility's soluble oil waste in a manner consistent with that used for the SOS Pond,<sup>69</sup> remained by September 1967.<sup>70</sup>
- In preparation for the new wastewater treatment system, in 1969 Rockwell constructed a dike that extended along the bank of the Kalamazoo River and backwater area north-northeast of the facility in 1969. The dike formed the area that was developed for the wastewater treatment ponds. The dike was comprised of materials excavated from beneath the location of the circa 1969 Manufacturing Complex addition. It is believed that native soil was also used.
- The eastern substation supplied power to a substation located inside the 1957 Manufacturing Complex addition via an overhead supply system. This internal substation was dismantled and a new substation was constructed within the circa 1969 building addition. A temporary outdoor transformer was constructed by the utility west of the facility in preparation for these modifications. Lightning reportedly struck this transformer, rupturing the unit and causing spillage of the dielectric fluid. It is likely that this transformer used dielectric fluids containing PCBs.
- The material underlying the circa 1969 addition to the Manufacturing Complex was excavated. The excavated material was used in the construction of the Inland Lakes and Streams dike and was also used to fill and grade the north end of the facility overlying the soluble oil ponds.<sup>77</sup>
- Meritor has identified the following items of interest in the photographs for this period:<sup>78</sup>
  - areas of dark-toned soil:<sup>79</sup> (1) between the east substation and the facility; (2) the western bank of the Interim Pond; (3) along the rail spur proximate to the chip-loading area, east of the rail shipping and receiving building, and east of the Oil Flotation House; and (4) along the bank of the SOS pond at the elevation of the surface water
  - areas of light-toned native soil. 80

# City of Allegan POTW

- The City of Allegan POTW appeared to continue to operate in the same manner as described previously.
- The configuration of the landfill in 1967 is shown in Figure 8.81

# **Backwater Areas**

- The area north-northwest of the facility no longer existed by 1964.
- The eastern portion of the area north-northeast of the facility was open to the Kalamazoo River. The dike constructed at the east end of this area was completed by the spring of 1969. The western portion of this backwater area was used, by Rockwell, from after 1964 (to 1970) for handling wastewater containing soluble oil. (See Former Rockwell Facility, above.)



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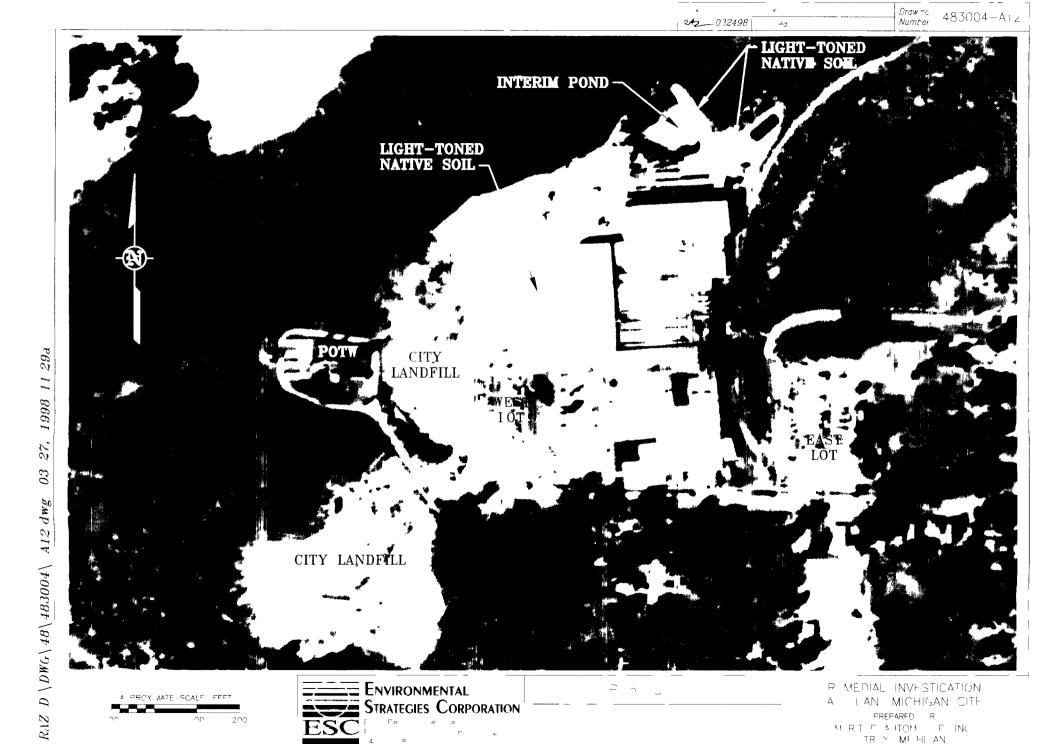
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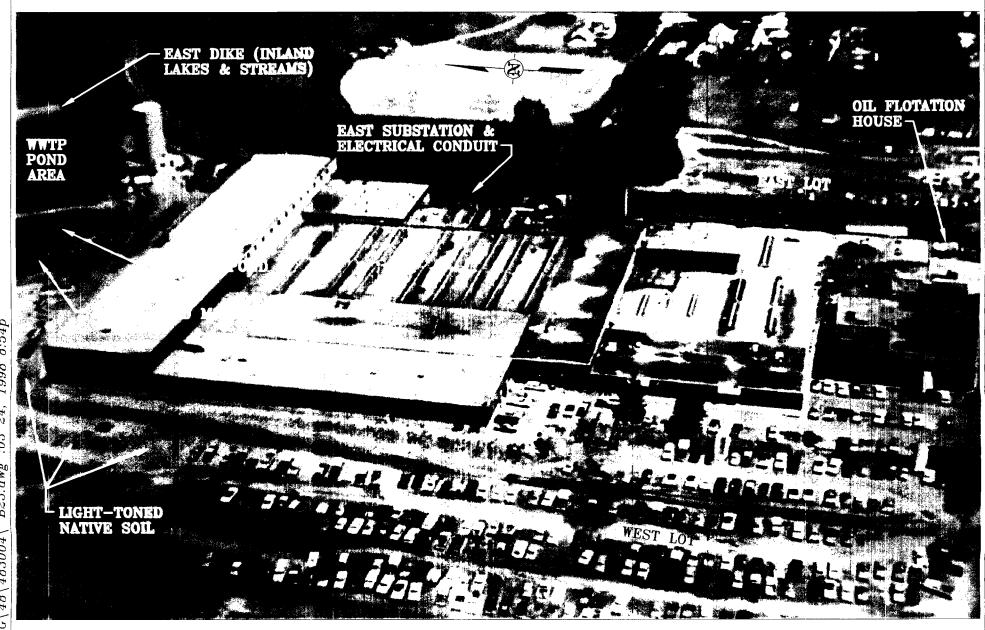
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TROY MICHIGAN

PEMEDIAL INVESTIGATION



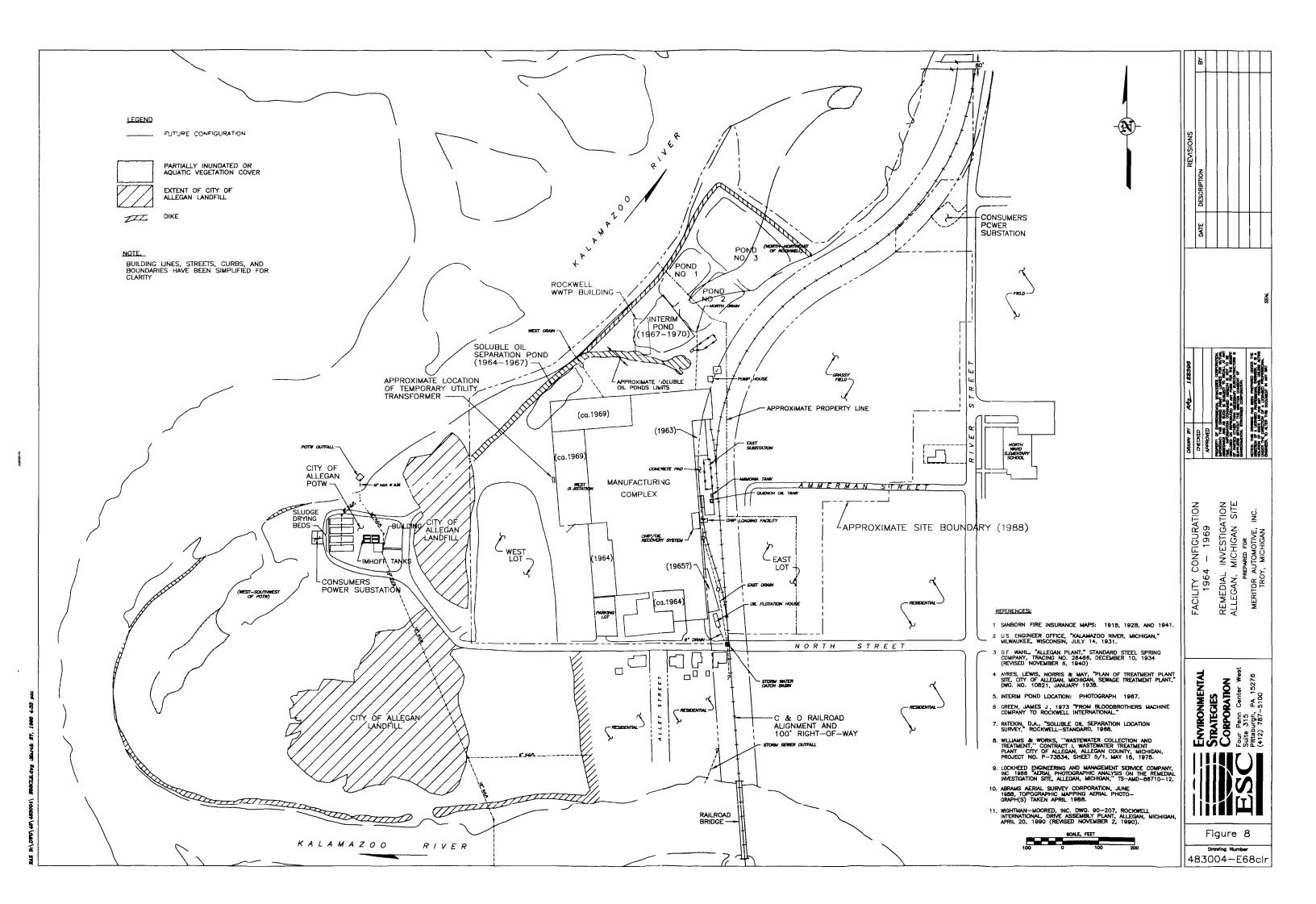




# Environmental Strategies Corporation

Four Fenn Center West, Suite 315 Pittsburgh, Pennsylvania 15276 (412) 787-5100 Photograph

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1970 to 1974

#### 1970 to 1974

Conditions in the vicinity of the Site in 1970/1971, 1973, and 1974, are summarized in Figure 9. Photographs documenting conditions for these dates include Photographs 1970/1971, 83 1973, and 1974.

#### General

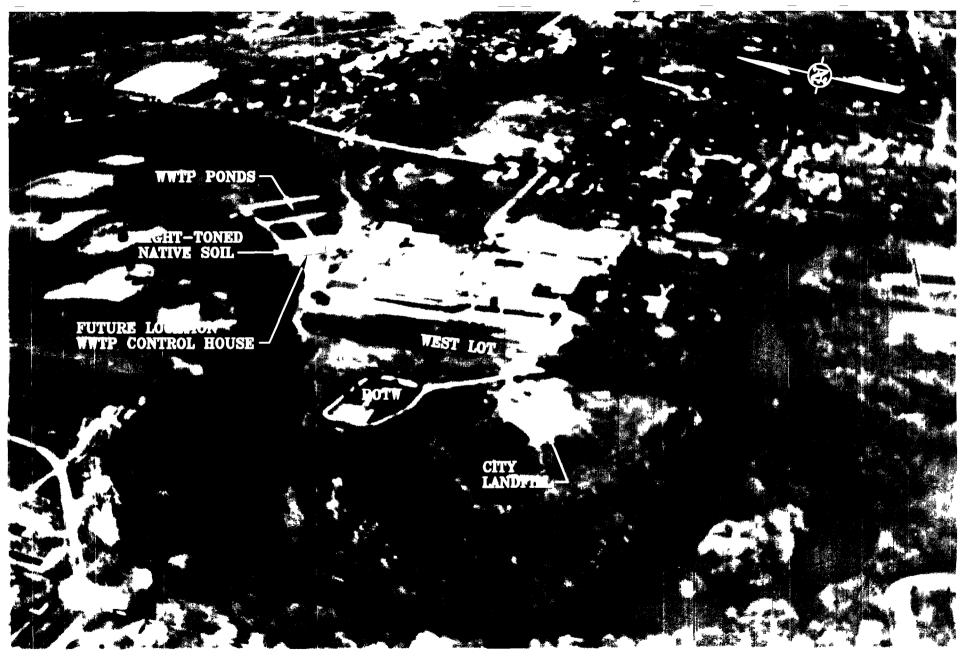
Land use was consistent with that observed in the previous period. Expansion at the former Rockwell facility included the construction of the Drive-Line Assembly and Heat Treat buildings (1972 and 1973) and completion of the WWTP system (1972).

## Former Rockwell Facility

- The facility operations during this period were consistent with the previous period. 85
- The Interim Pond was closed and the internal dikes for the wastewater treatment ponds and two in-ground holding tanks were constructed by July 1970. A new drain system (process sewer) was constructed within the Manufacturing Complex to convey wastewaters<sup>86</sup> to the holding tanks; the holding tanks<sup>87</sup> discharged to Pond No. 1. Contact-cooling water from heat treat was discharged to Pond No. 2 through the north drain; only Pond No. 2 discharged to Pond No. 3 through 1972.<sup>88</sup>
- A portion of the WWTP Control House was constructed by March 1971. The building was completed and the system was fully operational in 1972. Oily wastewater that had been stored in Pond No. 1 and the holding tanks was conveyed to the Control House for treatment. The treated water was then discharged to the ponds. Following this initial activity, wastewaters (including soluble and non-soluble oils) were conveyed through the process sewer to the holding tanks and then to the Control House for treatment. The treated water was discharged to the ponds (typically Pond No. 1); recovered usable oil was stored for reuse at the facility and the remaining oils were hauled offsite. Discharge from Pond No. 1 to Pond No. 3 was begun at this time. Contact-cooling water from Heat Treat continued to be discharged to Pond No. 2.
- National Pollutant Discharge Elimination System (NPDES) permits were granted in 1974 for outfalls from the east drain, west drain, and the WWTP. The permits for the east and west drains were rescinded in late 1974.<sup>92</sup>
- The dike constructed between Pond No. 1 and the Kalamazoo River in 1969 was replaced in 1974. Oily residue was believed to be seeping from Pond No. 1 through the existing dike to the river. In 1976, the equalization tanks were lined and three oil recovery wells were installed to eliminate further seepage of oil from this area to the river.<sup>93</sup>
- Construction of the Drive-Line Assembly and new Heat Treat buildings was begun east of the rail spur in 1972. The rail spur was removed, circa 1973, to facilitate the construction. Ballast from the northern rail spur embankment was used to heighten and widen the berms of the WWTP ponds. Additional native soils were brought from offsite to bring the southern rail spur area and areas east of the rail spur to grade.
- An electric meter pad and transformer poles were installed in the grassy area in circa 1973. It is likely that the transformers used dielectric fluids containing PCBs. A storm sewer was installed, circa 1974, to drain surface water from the grassy area. Surface water runoff from the facility, elevated areas north of the facility, River Street, and east of River Street could have accumulated in this area. The sewer discharged to the backwater area east of WWTP Pond No. 3. 97
- In the 1970s, Rockwell began testing their purchased oils to insure that they were not contaminated with PCBs. 98
- Meritor has identified the following items of interest in the photographs for this period:<sup>99</sup>
  - areas of dark-toned soil: 100 (1) west-southwest of the WWTP Control House; (2) northeast of the Manufacturing Complex; and (3) northwest corner of the facility
  - areas of light-toned native soil 101
  - areas of miscellaneous debris placement northwest of the facility. 102

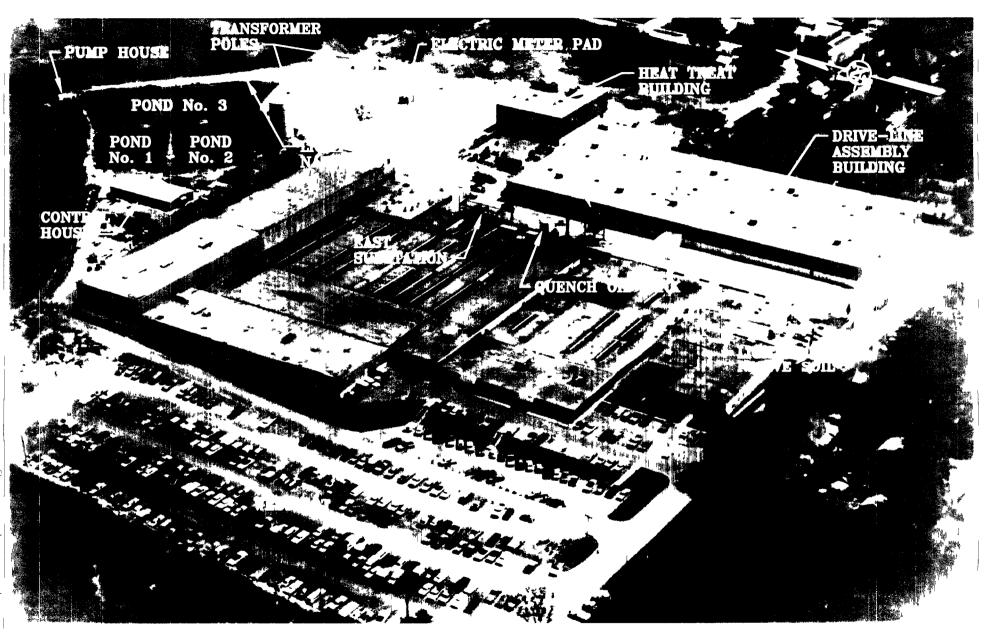
### City of Allegan POTW

- The City of Allegan POTW appeared to continue to operate in the same manner as described previously.
- Operation of the landfill ceased before 1974. 103





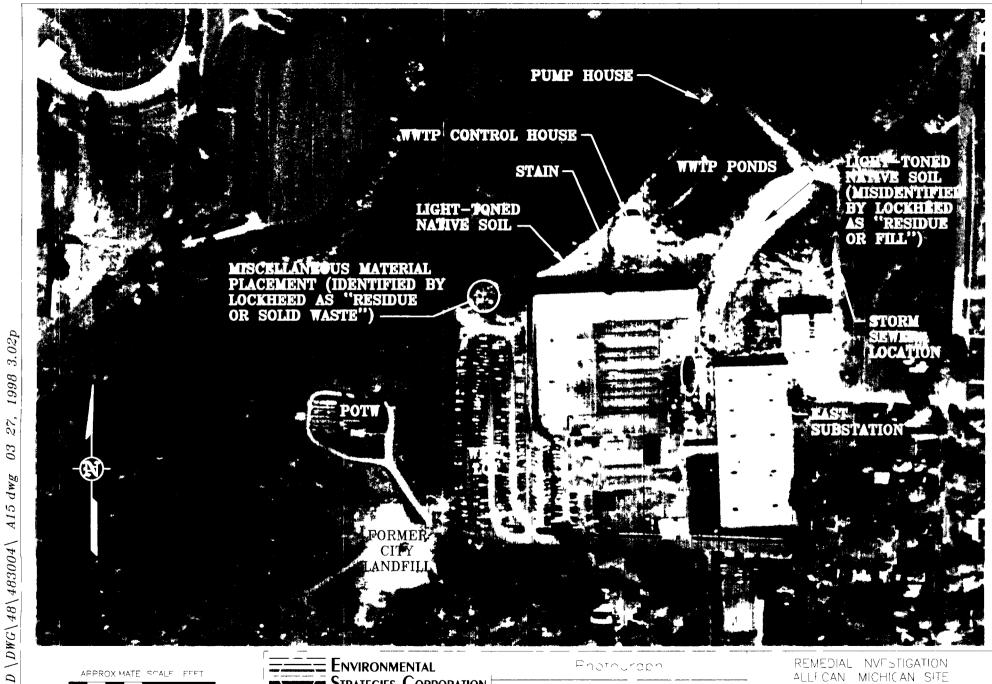
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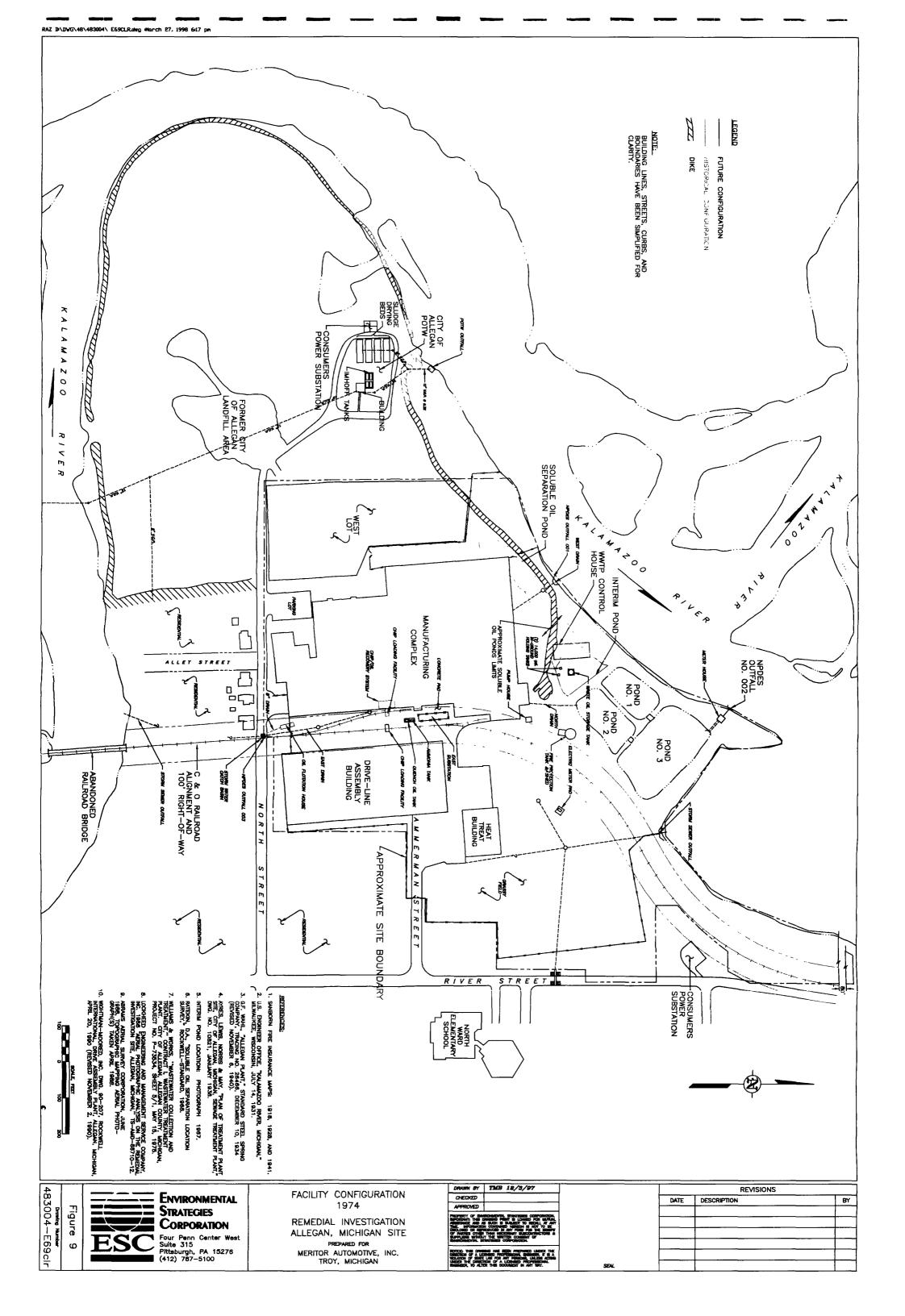
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After 1974

#### **After 1974**

Current conditions in the vicinity of the Site (after 1974) are shown in Figure 10.

### General

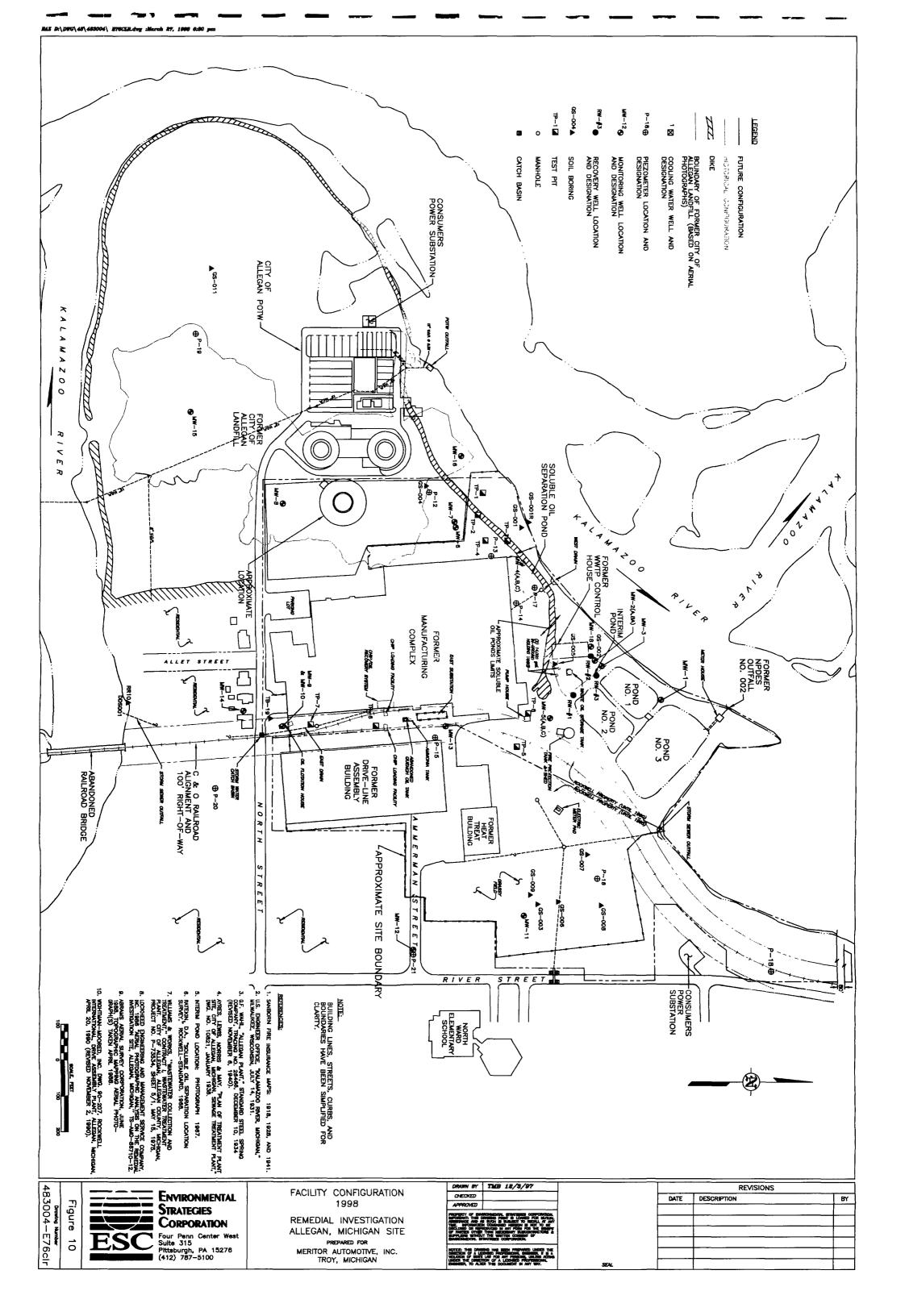
• Land use was generally consistent with that observed in the previous period. Changes at the former Rockwell facility are described below.

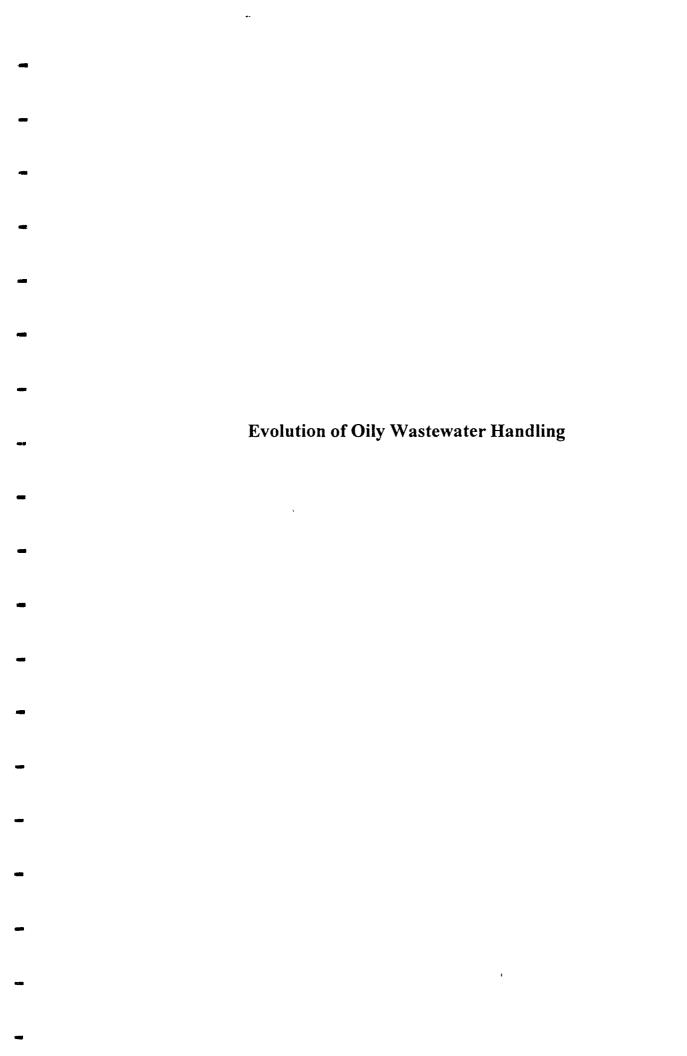
## Former Rockwell Facility 104

- The facility operations during this period were consistent with the previous period. However, during the mid-1980s, Rockwell began to scale back operations. By 1987, decommissioning activities had begun. By January 1990, inventory materials were transferred to other Rockwell facilities and the floor drains between the Manufacturing Complex and WWTP were plugged. Other activities included asbestos removal.
- In the 1980s, oils containing PCBs in the transformers and capacitors were removed, properly disposed of, and replaced with non-PCB containing oils in the 1980s.
- The WWTP was in use until 1992 to handle miscellaneous storm water runoff. The final discharge through Outfall 002 was on December 31, 1988. The in-ground concrete holding tanks (within the Control House) were cleaned, filled with sand, and brought to floor grade with concrete in 1992. The exterior, 14,000-gallon capacity in-ground holding tanks were cleaned and backfilled with sand in 1992.
- In 1975, an oil sheen was observed on the surface of the river adjacent to Pond No. 1. The source was identified as the in-ground equalization tanks. The tanks were cleaned and lined and three oil recovery wells were installed in 1976. Operation of the wells ceased in 1992. An oil sheen was again observed on the river surface in 1993. The recovery wells were reactivated in the spring of 1993 and migration of the sheen on the river was inhibited by sorbent booms. Based on the absence of visual evidence of separate phase oil, operation of the wells was discontinued in the fall of 1994. The replacement of sorbent booms also ceased in the fall of 1994.
- Rockwell returned portions of the West Lot to the city in the 1970s and 1990s to facilitate the construction of POTW upgrades. The remaining western portion of the facility was sold to the Allegan Industrial Redevelopment Corporation (AIRC) in 1990. AIRC utilized the facility for various enterprises including paper and tire recycling. AIRC defaulted on taxes for this portion of the property and, in 1996, the property reverted to the City of Allegan. Currently, there is only one tenant, which appears to use the building for general storage.
- The eastern portion of the Rockwell facility was sold to Allegan Metal Finishing in 1995, which continues to operate in the Drive-Line Assembly Building.

## City of Allegan POTW

- Due to continuing failures to comply with the NPDES permit, the City of Allegan POTW was required to upgrade its system in the late 1970s. This system, which included a new treatment building and two clarifiers for secondary treatment, 108 went on line in 1978.
- The POTW was again required to upgrade its system in the early 1990s, resulting in the construction of a third clarifier. The new clarifier was constructed in 1996 over a portion of Rockwell's West Lot. 109





## **Evolution of Oily Wastewater Handling**

The first available documentation of wastewater handling suggested that the former Rockwell facility used three storm drain systems (north, west, and east drains) to also handle the limited oily process wastewater during the 1930s and 1940s. The plant machining and grinding operations used oil as a lubricant and coolant. The majority of this oil was recycled and sold after it could no longer be used due to breakdown and the presence of metal particles and dirt. Oil that clinged to machine parts was removed using a water wash process. The water from this process, which contained a dilute mixture of water and non-water soluble oil, became the oily wastewater effluent.

The Oil Flotation House was constructed in 1945 with approval from the Michigan Water Resources Commission, to separate oil from the facility wastewater. The separated oil recovered via this system was sold to and collected by outside contractors who took it offsite for use. The water was discharged to the city's storm water catch basin on North Street and ultimately to the Kalamazoo River downstream from the C&O Railroad bridge via the city storm sewer drainage pipe. This system handled all of the facility's oily wastewater through 1964.

The oil/water separation system in the Oil Flotation House was not designed to treat wastewater containing soluble oils whose use in the machining process increased at the facility in the early 1960s. Consequently, in 1964, the SOS Pond was constructed to treat wastewater containing soluble oil. By September 1967, this pond had been transposed to a new location (i.e., the Interim Pond). The soluble oil was collected directly from the machining equipment into small "pump carts" which were wheeled outdoors and the oil drained into the ponds. The soluble oil wastewaters were only removed from the equipment when the oil/water mixture became rancid. Wastewater containing non-soluble oil continued to be handled by the Oil Flotation House.

Rockwell began construction of a WWTP in 1969; by the spring of 1969, a dike that formed the WWTP pond area was constructed. By July of 1970, the internal dikes for the three WWTP ponds were constructed, two 14,000-gallon, in-ground holding tanks were installed, the contents of the Interim Pond were transferred to Pond No. 1, and the Interim Pond was closed. Thereafter, the facility's soluble oil wastewater was collected in a process sewer, conveyed to the in-ground holding tanks, and subsequently discharged to Pond No. 1. In 1972, the Control House and treatment system were completed and operational. Oily wastewater that had been stored in Pond No. 1 and the holding tanks were conveyed to the Control House for treatment. Following this startup activity, process wastewaters (including soluble and non-soluble oils) was conveyed to the WWTP system for treatment. The treated water was conveyed (typically) to Pond No. 1. Ultimately, the treated water was discharged from Pond No. 3 under a NPDES permit to the Kalamazoo River. Recovered usable oil was stored for reuse at the facility and the remaining oils were sold and hauled offsite.

The four significant periods of oily wastewater handling coincide with four specific areas.

• 1930s to 1945 – The low volume of wastewater that was generated was discharged through the storm water drains. Because oil was at a premium throughout this period, if not before, it is likely that the amount of oil entering the wastewater stream would have been low. Consequently, any potential effect of discharge to the Kalamazoo River or its backwater areas north of the facility would be anticipated to be minimal. The areas potentially affected by oily wastewater discharges include the backwater area north-northwest of the facility in the vicinity of the pre-1955 west drain, the area north-northeast of the facility in the vicinity of the north drain, and the Kalamazoo River in the vicinity of the storm sewer discharge (i.e., via the east drain).

During the RI, investigation in these areas was performed by direct means or via downgradient groundwater quality monitoring.

• 1945 to 1964 – With the expansion of production during World War II, additional process wastewater was generated. The Oil Flotation House was constructed in 1945 and used through 1972 to separate wastewater containing non-soluble oils. Reportedly, the volume of oil present in the wastewater discharged after separation was minimal. Oil was sporadically observed in the discharge from the storm sewer following some periods of heavy precipitation due to the influx from the roof drains and storm water runoff from other sources.

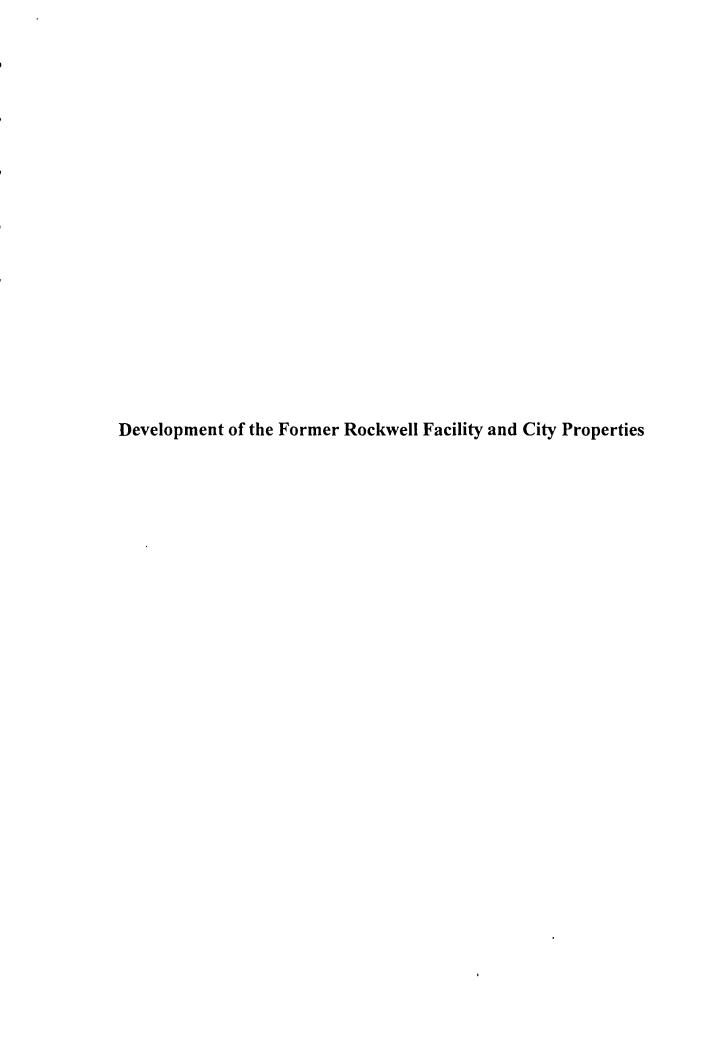
A monitoring well (MW-10) was installed during the RI within the limits of the former Oil Flotation House building. Residual material may be present within the former wastewater separation process vault as a result of the oily wastewater handling operations.

# Evolution of Oily Wastewater Handling (continued)

- 1964 to 1970 Limited quantities of rancid, soluble oil wastewater were directed to the Oil Flotation House in the early 1960s. Soluble oil separation ponds were constructed at the north end of the facility and used for the period of 1964 to 1970 to handle these wastes. There is oil present in the soils and at the groundwater surface in the areas in which the SOS and Interim ponds were located based on the findings generated during the RI<sup>112</sup> and an investigation performed in this area in December 1997. 113
- 1970 to 1988 Wastewaters containing soluble oils and non-soluble oils were directed to the facility's WWTP beginning in 1970 and 1972, respectively. The treatment system was operated until 1988. Any impact from operation of the pond system is believed to be limited to the sediments on the bottom of the ponds and the Pond No. 1 dike walls (as potentially affected by the temporary storage of oily wastewater in this pond from 1970 to 1972).

The following actions are anticipated to be undertaken regarding each of the four areas associated with these periods of oily wastewater handling:

- The locations of the north drain, the pre-1955 west drain, and the east drain are within identified areas of interest (WWTP, SOS Pond, and Oil Flotation House, respectively) that will be addressed as interim measures, or carried into the feasibility study for evaluation of potential remedial action.
- The extent of impact proximate to the Oil Flotation House will be confirmed during an interim remediation action or a focused feasibility study.
- The presence of oil on the groundwater surface in the vicinity of the soluble oil separation ponds (SOS and Interim ponds) will be addressed as an interim remediation action. Future remedial action is anticipated following completion of the feasibility study.
- It is Meritor's intent to decommission the WWTP ponds as an interim measure consistent with the NPDES permit and applicable and appropriate standards as approved by USEPA. The decommissioning will result in a wetland habitat.



## Development of the Former Rockwell Facility and City Properties

## Former Rockwell Facility

The former Rockwell facility expanded repeatedly from the construction of the first building in 1908 through the completion of the Drive-Line Assembly Building and Heat Treat Building in the 1970s.

Through 1950, facility expansions were to the north, confined to the east by the rail spur and the west by the existing dike. All of these expansions appear to have overlain previously existing ground surface. Miscellaneous materials (trash) and fill material were placed along the northern limit of the facility and adjacent to the backwater area during the 1940s and 1950s. By 1955, the backwater area north-northwest of the facility had been backfilled to match the existing grade of the Manufacturing Complex. This filling, and the ongoing filling north of the facility provided additional property for expansion of the facility, including additions to the north (1956) and to the west (1957).

After 1960, significant expansion of the facility was to the west and northwest. To facilitate these expansions, Rockwell moved the SOS Pond to the east via progressive filling from the west and excavation to the east. Concurrently, Rockwell excavated the materials underlying the circa 1969 western building expansion, probably including a portion of the original SOS Pond. These materials were used to: fill the subsequent soluble oil ponds; fill the area between the original pond and the river (expanding the distance between the two from 15 to 40 feet); and, construct a portion of the Inland Lakes and Streams dike. This dike was subsequently incorporated into the WWTP pond system that was developed in the former backwater area north-northeast of the facility.

The final expansion activities at the former Rockwell facility occurred in the early 1970s, when a Drive-Line Assembly Building and a new Heat Treat Building were constructed east of the rail spur. During this expansion, Rockwell removed the railroad embankment that separated this newly developed area from the WWTP area. The embankment, including rail ballast material that had accumulated since the 1900s was used to heighten and widen the berms of the WWTP ponds.

A mixture of various materials is present in the northern portion of the facility as a result of the expansions to the north (after the 1950s) and the west. This mixture includes clean (light-toned) soils, miscellaneous trash, and soils that were potentially affected by the utility's operation of electrical substations and transformers or via the handling of wastewater containing soluble oils. Much of this fill mixture is apparently present north of the existing facility between the western limit of the (original) SOS Pond and the (final) Interim Pond and between the SOS Pond and the river. A portion of this mixture may also be present in the vicinity of the WWTP ponds.

#### City of Allegan POTW and Landfill

The visible portion of the POTW did not change from 1940 to the 1970s. The same type of treatment (primary) is believed to have been performed throughout this period. In addition, the current NPDES outfall location is believed to be consistent with the discharge point for the original facility. Although there is limited information regarding the handling of the plant's influent, effluent, and sludges, some facts regarding the POTW facility are known.

- Construction of the POTW resulted in significant alteration to the backwater areas west-southwest and south of the POTW, particularly during the period of 1938 to 1950
- Constituents that were detected in samples of the influent, effluent, and sludge collected in the 1980s were similar to those detected in the soil and groundwater samples collected from the POTW/landfill area during the RI.
- The POTW received a variety of wastes from domestic and industrial sources throughout its history (including untreated industrial effluents).
- The POTW had numerous violations of their NPDES permit that resulted in the need to upgrade the system in the 1970s and again in the 1990s.
- The materials in the vicinity of the original POTW, including areas that had been landfilled, were excavated in preparation for the upgrade of the facility in the 1970s. These materials were moved to the north and/or south of the location of the new facility (clean fill was brought in to regrade the area in preparation for the new construction.
- The POTW never received industrial waste effluents from the former Rockwell facility.

# Development of the Former Rockwell Facility and City Properties (continued)

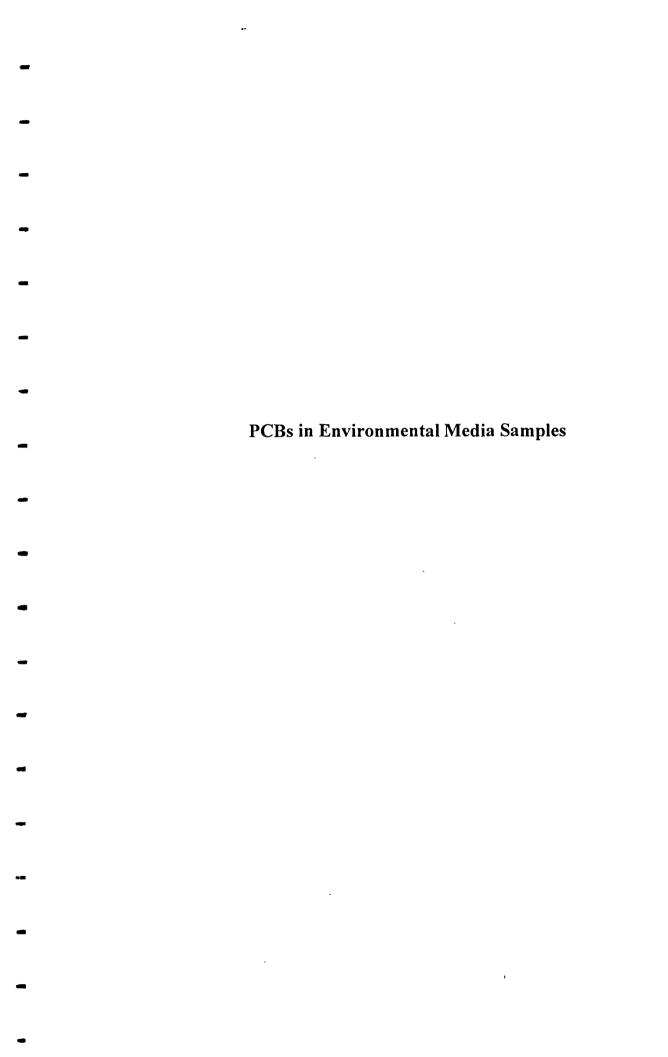
# City of Allegan POTW and Landfill (continued)

The extent of the landfill changed in size and location throughout its operation from circa 1950 to circa 1974. There is no documentation of the materials that were disposed in the landfill. The following is known about the landfill's operations.

- The backwater area west of the former Rockwell facility was developed as the original location of the city's landfill circa 1950 through 1955.
- The backwater area south of the POTW was developed as part of the landfill circa 1960 to 1969).
- The landfill materials were periodically burned off

In addition, the landfill is not believed to have received any waste material from the former Rockwell facility.

The limited information that is available with regard to the city's operations indicates that both the POTW and landfill, and particularly the landfill, posed significant potential impacts to the soil and groundwater underlying this area.



## PCBs in Environmental Media Samples

Low levels of several PCB Aroclors were detected in soil samples from 12 of 40 locations (13 of 97 samples), LNAPL samples from 2 of 3 locations, and one or more sediment samples from each of the WWTP ponds collected during the RI. The soil and LNAPL data are summarized in Table I, as are the detected Aroclors and concentrations. These data indicate that PCBs are found in some locations but are not pervasive. The relatively low levels of PCBs and their limited extent also suggest that PCBs were not necessary and were not routinely used in the manufacturing operations at the former Rockwell facility. In fact, as PCBs are not soluble, they would be of no benefit as an additive in soluble oils. If PCB-containing oils had been used at the facility, the concentrations detected in site media would have been much higher than observed. The PCBs detected in the samples collected at the former Rockwell facility are believed to have resulted from the presence of oils or other materials purchased for use at the facility that were contaminated by PCBs or are related to contamination associated with electrical equipment at the facility that contained PCBs.

In the 1970s, Rockwell initiated a practice of insuring that the oils purchased for use at the facility did not contain PCBs. Because there would have been no benefit in using PCB-containing oils in the facility operations, such use would have been uneconomical. It is possible that before this time, however, oils were purchased that may have contained low levels of PCBs as unintended contaminants as introduced by either the vendor or transporter.

It is known that transformers and capacitors located at the facility would have used PCB-containing oils into the 1980s. Standard operation of the electrical equipment could have resulted in the presence of PCBs on the ground surface. The soils could, subsequently, have been relocated during the various facility expansions (particularly at the north end of the facility) and closure of the soluble oil ponds (SOS and Interim Ponds).

Sample locations that are believed to be affected by oils contaminated with PCBs and potentially related to the facility include the following.<sup>119</sup>

- P-13, P-14, and P-17 are located in the immediate vicinity of the SOS Pond (Figure 10). Aroclor 1254 was detected in three soil samples collected from these locations at concentrations of 0.34 to 1.6 parts per million (ppm) and in LNAPL samples collected from P-17 on two occasions at concentrations of 7.1 to 12 ppm. The potential sources of PCBs in this area include: (1) the handling of soluble oil wastewater that may have contained PCBs as unintended contaminants; or (2) the use, for closure of the ponds, of soil and other materials contaminated by PCBs (including material underlying the circa 1969 Manufacturing Complex addition which may have been contaminated by the operation of the west substation [circa 1946 to circa 1955] or the transformer that was ruptured in this area circa 1969).
- TP-6 and TP-7 are located along the former rail spur (Figure 10). Aroclor 1254 was detected in two soil samples collected from these locations at concentrations of 0.0023 and 0.0027 ppm. A potential source of PCBs at these locations include the oiling of ballast by the railroad as a weed and dust control measure. Location-specific sources include oil associated with the steel chip loading area, near TP-6, and oily wastewater conveyance via the east drain to the Oil Flotation House, near TP-7. Each of these sources of oil may have contained PCBs as unintended contaminants.
- MW-10 is located within or in close proximity to the former Oil Flotation House building (Figure 10).
   Arolcor 1254 was detected in both LNAPL samples collected from this location at concentrations of 3 to 13 ppm. The potential source of PCBs at this location is believed to be operation of the Oil Flotation House and the presence of oil in the wastewater that may have contained PCBs as unintended contaminants.
- MW-13 is located immediately adjacent to the east substation. Aroclor 1260 was detected in the surface soil sample collected beneath the concrete pavement at this location at a concentration of 0.44 ppm. The potential source of PCBs at this location is believed to be the use of dielectric fluids containing PCBs in the electrical equipment within the east substation from the 1940s to the 1980s.
- GS-003 and GS-006 are located in the grassy area where no facility-related operations occurred (Figure 10). Aroclor 1254 was detected in the surface soil samples collected from these locations at concentrations of 1.2 and 0.26 ppm. The potential sources of PCBs at these locations include (1) the presence of electrical equipment in the area and the oils associated with the dielectric fluid that may have contained PCBs; (2) the use of pesticides in the grassy area and as transported to the Site via surface water runoff; <sup>120</sup> and (3) surface water runoff from the northeastern portion of the facility (including the former rail spur ballast) and adjacent properties as potentially affected by many sources.

# PCBs in Environmental Media Samples (continued)

- Pond sediment samples were collected from each of the WWTP ponds. Aroclor 1254 was detected in a majority of the samples at concentrations of 0.23 to 23 ppm. The potential sources of PCBs in these samples include the presence of PCBs as unintended contaminants in soluble oil wastewaters that were stored in Pond No. 1 (1970 to 1972) and the presence of PCBs in the rail spur ballast that was used to heighten and widen the pond dikes (i.e., PCBs were present in the oils used by the railroad as a weed and dust control measure).
- Soil sample DDS001 and riverbank sediment sample RR10 were collected adjacent to each other approximately 100 feet downstream of the abandoned railroad bridge. This sampling location was approximately 10 feet upstream from a soil depression further inshore, close to the location of an old city storm sewer outfall indicated on Figure 10. This storm sewer received flows from the former Rockwell facility as well as other sources that may have discharged contaminants. The soil sample contained black material with a hydrocarbon odor. The riverbank sample had a slight oil sheen. The composition of PCBs in both of these samples closely resembled that of Aroclor® 1254 and had no similarity to the composition of PCBs in sediments sampled from any location in the Kalamazoo River. The PCB composition of these two samples closely resembles that found at the former Rockwell facility but the concentration in soil sample DDS01 (35 ppm) is fully an order of magnitude higher than measured in duplicate LNAPL samples (average 3.1 ppm) collected in the vicinity of the former Oil Floatation House. Therefore, although material historically discharged from the former Oil Floatation House to a storm sewer is a potential source of these PCBs, the discrepancy in concentration is difficult to explain assuming that there would be dilution of any material from that location.

## Sample locations that are believed to be affected by other sources include:

- GS-001R is located immediately adjacent to the river. Aroclor 1260 was detected in a sample and a confirmatory sample collected from the ground surface at this location at concentrations of 0.9 and 0.055 ppm. The source of this constituent is uncertain.
- MW-14 is located in the driveway of a residence (circa 1873) south of North Street from the former Rockwell facility. Aroclors 1242 and 1260 were detected in the surface soil sample collected at this location from beneath an asphalt driveway at concentrations of 0.029 and 0.026 ppm. The potential sources of PCBs at this location are not related to the former Rockwell facility (including the rail spur) due to the absence of any plausible means of migration and the prevalence of Aroclor 1254 in samples collected at the facility. Potential sources may include nearby electrical equipment, the use of oils containing PCBs in the asphalt pavement, or past oiling for dust control.
- MW-15 and MW-16 are in areas that were previously used as part of the city's landfill. Aroclors 1248 and 1254 were detected in a soil sample collected from MW-15 at concentrations of 0.33 and 0.27 ppm; Aroclor 1260 was detected in two soil samples collected from MW-16 at concentrations of 0.014 and 0.088 ppm. The presence of PCBs at these locations is believed to have resulted from the city's operations based on (1) landfilling activities in these areas including the associated presence of pesticides in these samples; (2) the presence of PCBs in POTW sludges and influent and the placement of soils and materials from beneath the POTW administration building and clarifiers in the 1970s on the ground surface at these locations; and (3) the absence of any plausible means of migration from the Rockwell facility. 121

Lable 1 Summary of PCB Detection and Source Identification Former Rockwell International Corporation Facility Allegan, Michigan Site (a)

Sample Location	Sample Media (b)	Sample Interval (ft-bgs) (c)	Detected Arocloi	Reported Concentration (ppm) (d)
Onceta				
Onsite P-13	soil	28 - 30	1254	0 62
P-14	soil	21 – 23	1254	0 34
P-14 P-17	soil	16 – 18	1254	16
r-1/	LNAPL	NA (e)	1254	12 (f)
	LINALL	NA (c)	1254	7 1 (g)
TP-6	soil	8	1254	0 0023
TP-7	soil	12	1254	0 0023
MW-10	LNAPL	NA	1254	13 (f)
(VI VV - 10	DIVIII D	NA	1254	3 (g)
		NA (h)	1254	3 6
MW-13	soıl	0 – 1	1260	0 44
	3011	0 - 1 (1)	1260	0 038
GS-001R	soıl	0 – 0 5	1260	0 9
00 00		0 - 0.5(1)	1260	0 055
		0 - 0.5 (h)	1260	0 064
GS-003	soıl	0 – 0 5	1254	1 2
GS-006	soil	0 – 0 5	1254	0 26
Offsite				
MW-14	soil	0 - 0.5	1242	0 029
		1260		0 026
MW-15	soil	2 – 4	1248	0 33
		1254		0 27
MW-16	soil	0 05	1260	0 014
	2 - 4	1260		0 088
		2 - 4 (h)	1260	0 108
DDS001	soil	1 – 1 5	1254	35
RR10	riverbank	0 - 0 1	1254	5 2
	sediment			

a' Environmental Strategies Corporation, McLaren/Hart Inc , PTI Environmental Services, 1998, 'Remedial Investigation Report, Former Rockwell International Corporation, Allegan Michigan Site,' Meritor Automotive, Inc Troy, Michigan, February 9

b/ LNAPL = light non-aqueous phase liquid

c/ ft-bgs = feet below ground surface

d/ ppm = part per million e/ NA = not applicable

f' Sample collected in 1993 concentration as reported by USEPA

g/ Sample collected in 1996

h/ Duplicate sample

ı/ Confirmatory sample

Footnotes

#### **Footnotes**

In October 1997, Meritor and its subsidiaries became the successors to those entities that previously comprised Rockwell International Corporation's Automotive Division.

- <sup>3</sup> Administrative Consent Order. 1988. U.S. Environmental Protection Agency and Rockwell International Corporation. July 14.
- <sup>4</sup> Specific sources are identified in each figure referenced.

# <sup>5</sup> Sources:

- Lake, D.J. 1873. "Atlas of Allegan County, Michigan." C.O. Titus. Philadelphia, Pennsylvania.
- The Kace Publishing Company. 1895. "Illustrated Atlas of Allegan County, Michigan." Racine, Wisconsin.
- Geo. A. Ogle & Company. 1913. "Standard Atlas of Allegan County, Michigan." Chicago, Illinois.
- Sanborn Fire Insurance Maps: 1918 and 1928.
- Ayres, Lewis, Norris and May. 1938. "Plan of Treatment Plant Site, City of Allegan, Michigan, Sewage Treatment Plant." Dwg. 10821. January.
- M. Fleming. 1998. Personal communication with Mr. Howard Burke, former Rockwell employee, Allegan, Michigan (1940-1975). February.

## <sup>6</sup> Sources:

- The Kace Publishing Company. 1895. "Illustrated Atlas of Allegan County, Michigan." Racine, Wisconsin.
- Sanborn Fire Insurance Map: 1911.
- Geo. A. Ogle & Company. 1913. "Standard Atlas of Allegan County, Michigan." Chicago, Illinois.
- Planning Research Corporation. 1986. "Rockwell Allegan Plant, Responsible Party Search." Draft Report. U.S. Environmental Protection Agency, Office of Waste Programs Enforcement. January 20.
- M. Fleming. 1998. Personal communication with Mr. John Pahl, local historian. February.
- <sup>7</sup> U.S. Engineer Office. 1931. "Kalamazoo River, Michigan." Sheet No. 1. Milwaukee, Wisconsin. July 14.

## 8 Sources:

- The Allegan Gazette. 1936. "To Celebrate Dam Opening." July 16. The Allegan Gazette. 1936. "Points About the Dam." August 13.

# 11 Sources:

- The Kace Publishing Company. 1895. "Illustrated Atlas of Allegan County, Michigan." Racine, Wisconsin.
- Wahl, G.F. 1934. "Allegan Plant." Tracing No. 26466. Standard Steel Spring Company. December 10. (Revised November 6, 1940).
- M. Fleming. 1998. Personal communications with Mr. Howard Burke, former Rockwell employee, Allegan, Michigan (1940-1975) and Mr. John Pahl, local historian. February.

## 13 Sources:

- Green, James J. 1978. "From Blood-Brothers Machine Company to Rockwell International."
- Planning Research Corporation. 1986. "Rockwell Allegan Plant, Responsible Party Search." Draft Report. U.S. Environmental Protection Agency, Office of Waste Programs Enforcement. January 20.

# <sup>14</sup> Sources:

- Sanborn Fire Insurance Maps: 1918 and 1928.
- Wahl, G.F. 1934. "Allegan Plant." Tracing No. 26466. Standard Steel Spring Company. December 10. (Revised November 6, 1940).
- Green, James J. 1978. "From Blood-Brothers Machine Company to Rockwell International."

Annealing was used to reduce stress in the steel and improve its machinability for subsequent fabrication. Source: United States Steel Corporation. 1964. "The Making, Shaping and Treating of Steel." H.E. McGannon, Ed. 8th Edition.

<sup>&</sup>lt;sup>2</sup> Environmental Strategies Corporation, McLaren/Hart Inc., PTI Environmental Services. 1998. "Remedial Investigation Report, Former Rockwell International Corporation, Allegan, Michigan Site." Meritor Automotive, Inc. Troy, Michigan. February 9.

<sup>&</sup>lt;sup>9</sup> The Allegan Gazette. 1937. "Blood Brothers Become Customer on City Lines; Will Boost Monthly Income Up by Five or Six Hundred; Board Will Meet." May 21.

<sup>&</sup>lt;sup>10</sup> The approximate date when commercial production of PCB began was 1929. Erickson, M. 1997; Analytical Chemistry of PCBs, 2<sup>nd</sup> Ed, CRC series, Lewis Publishers, Boca Raton. Page 2 and 35.

<sup>&</sup>lt;sup>12</sup> Green, James J. 1978. "From Blood-Brothers Machine Company to Rockwell International."

## 15 Sources:

- Anderson, K. 1998. "Kalamazoo River Study Group v. Rockwell International Corporation, Expert Report of Kim E. Anderson, Ph.D. for Defendant Rockwell International." Mr. Joseph Basta, Dykema Gossett. January 13.
- M. Fleming. 1998. Personal communications with Mr. Richard Haskins, former Rockwell employee, Allegan, Michigan (1947-1973). March. (Mr. Hasksins also stated that the only equipment that utilized PCB-containing oils were the electrical transformers at the facility.)

## 16 Sources:

- M. Fleming. 1998. Personal communication with Mr. Richard Haskins, former Rockwell employee, Allegan, Michigan (1947-1973). March.
- Liquid carburizing (or case-hardening) was performed to harden the outer surface of the steel. Source: United States Steel Corporation. 1964. "The Making, Shaping and Treating of Steel." H.E. McGannon, Ed. 8th Edition.

# 17 Sources:

- E.E. Paulson, Plant Engineer. 1970. "Preliminary Report, Waste Disposal, Allegan, Michigan." North American Rockwell Environmental Control Program. July.
- E.E. Paulson, Plant Engineer. 1971. "Waste Disposal, Allegan, Michigan, Proposal Design Report." March.

In addition, it should be noted that oil was at a premium throughout the 1930s and 1940s, if not before, and would be unlikely to be wasted via any means.

<sup>18</sup> Owen-Arnold manufactured burial caskets and funeral supplies. Their facility included woodworking shops and a kiln. Excel Manufacturing Company is believed to have produced packing material.

#### Sources:

- Geo. A. Ogle & Company. "Standard Atlas of Allegan County, Michigan." 1913. Chicago, Illinois.
- Sanborn Fire Insurance Maps: 1918, 1928, and 1941.

- <sup>20</sup> A drawing of the Kalamazoo River Bisn, dated 1931, shows that the area was "meadow;" however, no backwater areas were shown. (Source: U.S. Engineer Office. 1931. "Kalamazoo River, Michigan." Sheet No. 1. Milwaukee, Wisconsin. July 14.)
- <sup>21</sup> Vertical aerial photographs for the following years are presented in this report: 1938, 1947, 1950, 1955, 1960, 1967, and 1974. The aerial photographs for each of these years, except 1967, were presented in: Lockheed Engineering and Management Services Company, Inc. 1986. "Aerial Photographic Analysis of the Rockwell International Site, Allegan, Michigan." U.S. Environmental Protection Agency. TS-AMD-86710-12. Photograph 1967 was obtained by Meritor in October 1997.

Oblique aerial photographs for the following years are presented in this report: circa 1946 (1946ca), 1946, 1951, 1957, 1964, 1969, 1970/1971, and 1973.

A majority of these photographs were reviewed to evaluate the presence of potential environmental concerns identified by Lockheed in: PTI Environmental Services. 1998. "Aerial Photographic Interpretation, Allegan, Michigan Site." Meritor Automotive, Inc. Troy, Michigan. March.

The cutting oils contained high sulfur were reclaimed in the central portion of the Manufacturing Complex; sulfur was added back into the reclaimed oil for reuse at the facility; fresh oil was added on an as-needs-basis. (Source: M. Fleming. 1998. Personal communication with Mr. Richard Haskins, former Rockwell employee, Allegan, Michigan (1947-1973). March.)

- <sup>25</sup> M. Fleming. 1998. Personal communication with Mr. Richard Haskins, former Rockwell employee, Allegan, Michigan (1947-1973). March.
- <sup>26</sup> The initial date of use of cyanide-salt baths for heat treating is not known. Several sources indicate the end of the use of cyanide salts was in the late 1940s (presumably 1947):
  - M. Fleming. 1998. Personal communication with Mr. Richard Haskins, former Rockwell employee, Allegan, Michigan (1947-1973). March. (Mr. Haskin stated that one of the first actions that he took, after starting at the facility in 1947, was to remove this system of treatment. Mr. Haskin also stated that the latest the cyanide-salt baths could have been used was 1948.)

<sup>&</sup>lt;sup>19</sup> Indenture. 1920. Horace D. Moore by heirs to Allegan City. September 20.

<sup>&</sup>lt;sup>22</sup> Photographs 1938 and 1947.

<sup>&</sup>lt;sup>23</sup> M. Fleming. 1998. Personal communication with Mr. Lyle Bush. February.

<sup>&</sup>lt;sup>24</sup> Sanborn Fire Insurance Map: 1941.

- M. Fleming and D. Tripp. 1998. Personal communication with Mr. E.E. Paulson, former Rockwell employee, Allegan, Michigan (1964-1974). February and March. (Mr. Paulson was employed at the facility as the electrical engineer and subsequently as the environmental engineer. Mr. Paulson stated that cyanide was not used during his tenure at the facility. Mr. Paulson recalled that one cyanide pot was unearthed during excavation for construction of the Drive-Line Assembly or Heat Treat Building in approximately 1972. The approximate dimensions of the pot were 2 ft x 2 ft x 2 ft. The pot was placed in a crate [3 ft x 3 ft x 3 ft] and disposed offsite.)
- Planning Research Corporation. 1986. "Rockwell Allegan Plant, Responsible Party Search." Draft Report. U.S. Environmental Protection Agency, Office of Waste Programs Enforcement. January 20. (Specifically, 1947.)
- M. Fleming. Personal communication with Mr. Phillip Backlund, Former Director of Facilities, Rockwell International Corporation. (Mr. Backlund indicated that he believed the end of the use of cyanide salts was the late 1940s).
- M. Fleming. 1998. Personal communication with Mr. John Pahl, local historian. February. (Mr. Pahl indicated that he believed the end of the use of cyanide salts was "after the war.")
- This information refutes Mr. Wm. Sebright's statement in the Hazard Ranking System (HRS), completed by USEPA's Field Investigation Team, indicating cyanide-salts were used until 1967. (Source: USEPA. 1984. "National Priorities List Ranking Hazardous Ranking Score Package." December 19.)
- <sup>27</sup> The use of the east, north, and west drains in 1968 was as follows (the system is not believed to have been changed significantly from the 1930s):
  - The east drain accommodated all reclaimable insoluble oil, water softener backwash, and boiler blowdown. After 1945, wastewater containing insoluble oil was diverted through the Oil Flotation House. After separation of the oil and water, the water was conveyed to the city's storm water catch basin on North Street and, subsequently, to the Kalamazoo River via the storm water drainage pipe.
  - The west drain accommodated waste generated from parts washing equipment, wastes from the condensate traps for the compressor room, and drains from the rest of the machine area and a small portion of Heat Treat. Before 1955, the west drain is believed to have discharged to the backwater area north-northwest of the facility (Figures 3, 4, and 5). After the backwater was closed in approximately 1955 (Photograph 1955), the drainage pipe is believed to have been extended and the outfall discharged to the river (Photograph 1957).
  - The north drain accommodated contact and non-contact cooling waters, overflow of reclaim water used in Heat Treat furnaces, the receiving dock drain, one outside concrete slab drain, and wastewaters from three heat treat washers. The north drain is believed to have discharged to the backwater area north-northeast of the facility (Figures 3, 4, and 5).
- <sup>28</sup> Oeming, Loring F. Stream Control Commission, State of Michigan. 1945. Untitled. M.E. Lent, Plant Engineer. Blood-Brothers Machine Company, Division of Standard Steel Spring Co. April 19.

<sup>29</sup> The function of the Oil Flotation House was to intercept the oil fraction of the wastewater and allow the remaining water to pass through to the storm sewer system that discharged south to the Kalamazoo River. The Oil Flotation House oil/water separation system was operated by manual controls. When it was noted that a sufficient quantity of oil accumulated, outside contractors pumped off the oil for offsite use. As the amount of oil waste was small, overflow (i.e., allowing oily wastewater into the storm sewer) would only take place during heavy rainstorms. (Source: Environmental Strategies Corporation, McLaren/Hart Inc., PTI Environmental Services. 1998. "Remedial Investigation Report, Former Rockwell International Corporation, Allegan, Michigan Site." Meritor Automotive, Inc. Troy, Michigan. February 9.) (Note: there are no drawings available that indicate the location of the conveyance from the east drain to the Oil Flotation House.)

USEPA has at various times commented on the practice of dealing with the facility's wastewater discharges at night based on information provided in: E.E. Paulson, Plant Engineer. 1970. "Preliminary Report, Waste Disposal, Allegan, Michigan." North American Rockwell Environmental Control Program. July. USEPA appears to have interpreted this information to indicate that Rockwell handled its discharges at night "making detection of large effluent flow unnoticed." This inappropriately reflects poorly on Rockwell's handling practices. If the comment ("making detection of large effluent flow unnoticed") is considered in its full context, it is apparent that because maintenance was commonly done during the night shifts, so as not to impede the facility's production, it would be difficult for the workers to notice the presence of oily wastewater (and not that it was performed to intentionally discharge oily wastewater at night so as not to be seen).

Previously, the means of conveyance from the Oil Flotation House to the river was uncertain (i.e., drainage ditch or pipe) and the discharge point was believed to be 20 or 30 feet downstream from the railroad bridge. It is now believed that wastewater from the Oil Flotation House discharged through the city's storm water drainage pipe to the river at a distance of 80 to 100 feet downstream from the bridge. This conclusion is based on additional review of available information, the identification of a storm water discharge pipe approximately 80 to 100 feet downstream of the railroad bridge, the known discharge of the east drain to the storm sewer catch basin on North Street, and engineering considerations.

<sup>&</sup>lt;sup>30</sup> Only the east substation is present today. Power poles between the former west substation and the POTW are visible in the historical photographs (Photographs 1946ca and 1946). A substation was also constructed at the POTW in approximately 1955 (Photograph 1955).

#### Sources:

- Wahl, G.F. 1934. "Allegan Plant." Tracing No. 26466. Standard Steel Spring Company. December 10. (Revised November 6, 1940).
- Ayres, Lewis, Norris and May. 1938. "Plan of Treatment Plant Site, City of Allegan, Michigan, Sewage Treatment Plant." Dwg. 10821. January.
- Green, James J. 1978. "From Blood-Brothers Machine Company to Rockwell International."
- Photographs 1938, 1946ca, 1946, 1950, 1951, and 1955.

## 31 Sources:

- Photographs 1946ca and 1946.
- Ayres, Lewis, Norris and May. 1938. "Plan of Treatment Plant Site, City of Allegan, Michigan, Sewage Treatment Plant." Dwg. 10821. January.
- <sup>32</sup> The following items of interest were reviewed by PTI based on identification by Lockheed in Photograph 1938:
  - The coal pile east of the Manufacturing Complex was misidentified as "heavy staining" by Lockheed.
  - The shadow from the construction pad for the 1940 building expansion was misidentified as a "trench" by Lockheed.

The following items of interest were reviewed by PTI based on identification by Lockheed in Photograph 1947:

- The coal pile east of the Manufacturing Complex was misidentified as "staining" by Lockheed.
- Two areas of low-stature bank vegetation or dark construction soils along the bank of the backwater area north of the facility were misidentified as "stains" by Lockheed.
- An area of darkened soil north of the facility was misidentified as an "unlined lagoon" by Lockheed

The following items of interest were reviewed by PTI based on identification by Lockheed in Photograph 1950:

- An area of darkened soil north of the facility was misidentified as an "unlined lagoon" by Lockheed
- Light-toned native soil present north and northwest of the facility on the bank of the backwater area was misidentified as "white-toned residue" by Lockheed.
- The electrical conduit leading from the east substation into the facility were misidentified as a "loading rack" by Lockheed.

#### Sources:

- PTI Environmental Services. 1998. "Aerial Photographic Interpretation, Allegan, Michigan Site." Meritor Automotive, Inc. Troy, Michigan. March.
- Lockheed Engineering and Management Services Company, Inc. 1986. "Aerial Photographic Analysis of the Rockwell International Site, Allegan, Michigan." U.S. Environmental Protection Agency. TS-AMD-86710-12.
- 33 The sources of the dark-toned soils are believed to be as follows:
  - (1) the dark-toned soil may reflect the presence of asphalt or cinders used for facility expansion or slope stabilization; Photograph 1946ca (Source: PTI Environmental Services. 1998. "Aerial Photographic Interpretation, Allegan, Michigan Site." Meritor Automotive, Inc. Troy, Michigan. March.)
  - (2) the dark-toned soil may reflect staining resulting from the presence of oils related to facility operations and/or from the east substation and as subsequently affected by roadway traffic (and not "spilled product from the nearby loading racks" as misidentified by Lockheed), or may be indicative of the cinders or asphalt used; Photographs 1946ca and 1950 (Sources: (1) PTI Environmental Services. 1998. "Aerial Photographic Interpretation, Allegan, Michigan Site." Meritor Automotive, Inc. Troy, Michigan. March. (2) Lockheed Engineering and Management Services Company, Inc. 1986. "Aerial Photographic Analysis of the Rockwell International Site, Allegan, Michigan." U.S. Environmental Protection Agency. TS-AMD-86710-12.)
  - (3) the dark-toned soil may reflect staining associated with the operation of the rail spur (i.e., oils used for weed and dust control) (there is no staining present proximate to the Oil Flotation House) or may be indicative of the cinders or asphalt used; Photograph 1946
  - (4) the dark-toned soil may reflect staining associated with the substation (i.e., oils) or may be indicative of the cinders or asphalt used; Photograph 1946.

- Photograph 1938: POTW construction area.
- Photographs 1946ca, 1946, 1947, and 1950: along the banks of the backwater areas at the former Rockwell facility.
- Photograph 1947: in the location of the 1950 building addition.

## 36 Sources:

- Ayres, Lewis, Norris and May. 1939. "Sewers Built During W.P.A. Program - 1938 and 1939. City of Allegan, Michigan, Intercepting and Lateral Sewers." Dwg. No. 10853. September.

- The Allegan Gazette. 1937. "Report City to Ask Board Aid in Sewage Plan." June 11.

- The Allegan Gazette. 1939. "Apply to WPA for \$12,000 Added Grant." June 23.
- Photograph 1938.

<sup>&</sup>lt;sup>34</sup> The areas of light-toned native soils, which were frequently misidentified as "residue" by Lockheed, were areas that frequently underwent subsequent expansion or other site disturbance.

<sup>35</sup> Photographs 1946 and 1950.

The POTW received (and continues to receive) sewage from residential, manufacturing, and commercial sources. Historically, the facility also received untreated industrial effluent from various enterprises. Rockwell's industrial effluents were never discharged to the POTW. (Source: Environmental Strategies Corporation, McLaren/Hart Inc., PTI Environmental Services. 1998. "Remedial Investigation Report, Former Rockwell International Corporation, Allegan, Michigan Site." Meritor Automotive, Inc. Troy, Michigan. February 9.)

## 38 Sources:

- Ayres, Lewis, Norris and May. 1938. "Plan of Treatment Plant Site, City of Allegan, Michigan, Sewage Treatment Plant." Dwg. No. 10821. January.
- Ayres, Lewis, Norris and May. 1939. "Sewers Built During W.P.A. Program 1938 and 1939. City of Allegan, Michigan, Intercepting and Lateral Sewers." Dwg. No. 10853. September
- Williams & Works. 1975. "Wastewater Collection and Treatment, Contract 1, Wastewater Treatment Plant." City of Allegan. Allegan County, Michigan.
- M. Fleming. 1998. Personal communication with Mr. Dwight Fargo, Superintendent, City of Allegan POTW. February.

The following generators of waste disposed at the landfill have been identified:

- L. Perrigo Company
- Tru-Heat
- Crescent Machine and Nipple Company
- Allegan Metal Finishing Company
- City of Allegan.

Source: Rockwell International. 1987. "Rockwell International Corporation, Allegan, Michigan NPL Site, 5HE-124." Basil G. Constantelos, Director, Waste Management Division, Hazardous Waste Enforcement Branch. U.S. EPA – Region 5. December 22.

- <sup>40</sup> Comparison of Photograph 1938 and Photograph 1947 indicates an increase in the areal extent (and potential depth) of the backwater areas west-southwest and south of the POTW, due to borrowing in these areas for soils (Figures 3 and 4 and Photographs 1938 and 1947). The POTW construction activities are believed to have included measures to control and potentially decrease the backwater areas southwest and south of the facility, including:
  - the development of a ditch to drain water from the backwater area west-southwest of the POTW to the Kalamazoo River (to the north) by 1947
  - the development of a ditch to drain water from the backwater area south of the POTW to the Kalamazoo River (to the south) by 1947
  - the development of a man-made pond between the Kalamazoo River and the backwater area south of the POTW (man-made pond) by 1947 (and a drainage ditch from this pond to the Kalamazoo River by 1950 [Photograph 1955]).

An ammonia tank was installed between the quench tank and the east substation circa 1957 (Photographs 1955 and 1957). The ammonia was used for nitriding, another method of case-hardening (Source: United States Steel Corporation. 1964. "The Making, Shaping and Treating of Steel." H.E. McGannon, Ed. 8<sup>th</sup> Edition.). Nitriding continued through 1986 (Source: M. Fleming. 1998. Personal communication with Mr. Richard Haskins, former Rockwell employee, Allegan, Michigan (1947-1973). March.).

A second cutting oil (chip/oil) recovery system and a chip-loading area were constructed circa 1955. The recovery system was located in the eastern portion of the Manufacturing Complex (Photograph 1955). The chip-loading area was located outdoors, immediately east of the recovery system, and included a conveyor and hopper to transfer the steel chips into rail cars. The

<sup>&</sup>lt;sup>37</sup> The Allegan Gazette. 1940. "Sewer Question Unsettled Yet." July 11.

<sup>&</sup>lt;sup>39</sup> Photographs 1947 and 1950.

<sup>&</sup>lt;sup>41</sup> Photographs 1938, 1947, and 1950.

<sup>&</sup>lt;sup>42</sup> Photographs 1938, 1946ca, 1946, 1947, and 1950.

<sup>&</sup>lt;sup>43</sup> Photographs 1938 and 1947.

<sup>44</sup> Photographs 1947 and 1950.

<sup>&</sup>lt;sup>45</sup> Green, James J. 1978. "From Blood-Brothers Machine Company to Rockwell International."

<sup>&</sup>lt;sup>46</sup> Green, James J. 1978. "From Blood-Brothers Machine Company to Rockwell International."

<sup>&</sup>lt;sup>47</sup> An exterior quench tank was constructed circa 1955 south of the east substation (Photographs 1951 and 1955).

recovered oil was stored for reuse. Oil that was not reclaimed was treated with steam to facilitate further separation; this oil was stored and sold. The remaining separated water was discharged to the east drain. (Source: Ralph W. Purdy, Michigan Water Resources Commission. 1965. Untitled. D.F. Wilber, Rockwell Standard Corporation. April. (With attached Report of Survey).)

51 The following items of interest were reviewed by PTI based on identification by Lockheed in Photograph 1955:

- A path down the bank to the backwater area north of the facility was misidentified as a "liquid waste dumping point" by Lockheed.
- An area of soil backfill in the former backwater area north-northwest of the facility was misidentified as a "large slick or accumulation of white-toned liquid waste" by Lockheed.
- An area of soils without vegetative cover (similar to the light-toned native soil) was misidentified as an area of "unidentified solid material" by Lockheed.
- The east substation was misidentified as "three vertical tanks" by Lockheed.

The following items of interest were reviewed by PTI based on identification by Lockheed in Photograph 1960:

- The cinder covered drive and parking areas north and west of the facility were misidentified as "stains" by Lockheed
- The east side of the rail spur, with sloughing light-toned soils, was misidentified as an area of "residue" by Lockheed.

#### Sources:

- PTI Environmental Services. 1998. "Aerial Photographic Interpretation, Allegan, Michigan Site." Meritor Automotive, Inc. Troy, Michigan. March.
- Lockheed Engineering and Management Services Company, Inc. 1986. "Aerial Photographic Analysis of the Rockwell International Site, Allegan, Michigan." U.S. Environmental Protection Agency. TS-AMD-86710-12.
- <sup>52</sup> The sources of the dark-toned soil are believed to be as follows:
  - (1) the dark-toned soil may reflect staining associated with the operation of the rail spur (i.e., oils used for weed and dust control) (the area proximate to the Oil Flotation House is not discernable) or may be indicative of the cinders or asphalt used; Photograph 1951
  - (2) the dark-toned soil may reflect staining associated with the operation of the substation (i.e., oils) or some may be indicative of the cinders or asphalt used in the general area; Photograph 1950
  - (3) Photograph 1955: source unknown; (Sources: (1) PTI Environmental Services. 1998. "Aerial Photographic Interpretation, Allegan, Michigan Site." Meritor Automotive, Inc. Troy, Michigan. March. and (2) Lockheed Engineering and Management Services Company, Inc. 1986. "Aerial Photographic Analysis of the Rockwell International Site, Allegan, Michigan." U.S. Environmental Protection Agency. TS-AMD-86710-12.)
    - Photographs 1957 and 1960: roadway surfacing (Source: Facility Drawing [on record at City of Allegan offices], 1963.)
    - Photograph 1960: source unknown (Source: PTI Environmental Services. 1998. "Aerial Photographic Interpretation, Allegan, Michigan Site." Meritor Automotive, Inc. Troy, Michigan. March.)

- Photograph 1955: northeast of facility (identified by Lockheed as "solid material")
- Photograph 1960: northeast of facility; edge of bank around cinder area; East Lot
- Photograph 1960: east of rail spur (see Photographs 1946, 1957, and 1964).

<sup>56</sup> Planning Research Corporation. 1986. "Rockwell Allegan Plant, Responsible Party Search." Draft Report. U.S. Environmental Protection Agency, Office of Waste Programs Enforcement. January 20.

<sup>&</sup>lt;sup>48</sup> This conclusion is based on the absence of any visible evidence of changed in the photographs or documented evidence of change.

<sup>&</sup>lt;sup>49</sup> Photographs 1947, 1951, 1955, 1957, and 1960.

<sup>&</sup>lt;sup>50</sup> Photographs 1951 and 1955.

<sup>&</sup>lt;sup>53</sup> The areas of light-toned native soils, which were frequently identified as "residue" by Lockheed, were areas that frequently underwent subsequent expansion or other site disturbance.

<sup>&</sup>lt;sup>54</sup> Photographs 1957 and 1960; identified by Lockheed as a "landfill" in Photograph 1960.

<sup>55</sup> Photographs 1955 and 1960.

<sup>&</sup>lt;sup>57</sup> Photographs 1955, 1957, and 1960.

<sup>&</sup>lt;sup>58</sup> The date of Photograph 1969 was previously believed to be 1968/1969. However, the photograph is now believed to represent conditions in 1969. This conclusion is based on the fact that an Inland Lakes and Streams Permit, dated September 1968, was granted by the Michigan Water Resources Commission, for the construction of a dike along the northern and eastern limits of the facility. The photograph shows that the eastern portion of the dike (i.e., the east dike of the WWTP pond area) has been constructed. The photograph also shows conditions during a period of foliage. It is unlikely that the construction of the dike

would have been constructed during the season in which it was granted (i.e., fall). The photograph also indicates activity in the grassy area (north of Ammerman Street) but no planting. Correspondence dated August 1969 indicated that an area of the Kalamazoo River had been diked off and that internal diking was anticipated thereafter, and that, on the completion of the internal diking, the present soluble oil pond (the Interim Pond) would be eliminated (Source: Chester Harvey, Bureau of Water Management. 1969. Untitled. D.F. Wilbur, Plant Manager, North American Rockwell Corporation. August 15.). Based on this information, the photograph is assumed to represent conditions in the spring of 1969.

Correspondence from the Michigan Department of Conservation, dated August 31, 1967, states that Rockwell could proceed with the filling activities before the permit was issued. (Source: George Taack, Lands Division, Michigan Department of Conservation. 1967. Untitled. Mr. Wilber, Universal Division, Rockwell Standard Corporation. August 31.) Mr. Paulson has stated that the construction of a dike and filling of the area north of the SOS Pond may have been completed at this time (and as observed in Photograph 1967), but that Rockwell did not proceed with the construction of the remainder of the dike (that which was specified in the September 1968 permit) until after the permit was received in September 1968. (Source: M. Fleming. 1998. Personal communication with Mr. E.E. Paulson, former Rockwell employee, Allegan, Michigan (1964-1974). March.)

It should be noted that the dike shown in the attachment to the permit (Attachment A to that document) does not correlate with the known, existing configuration of the dike.

#### 59 Sources:

- Photographs 1957, 1960, 1964, 1967, and 1969.
- Green, James J. 1978. "From Blood-Brothers Machine Company to Rockwell International."
- <sup>60</sup> The Allegan Gazette. 1968. "FP Corporation Approves Transfer of Municipal Power Plant." February 1.
- <sup>61</sup> This conclusion is based on the absence of any visible evidence of change in the photographs or documented evidence of change.
- <sup>62</sup> Mr. Paulson has stated that the SOS Pond was not present when he began his employment at the facility in 1964. (Source: Affidavit of Edgar E. Paulson, former Rockwell employee, Allegan, Michigan (1964-1974).)

"With the advent of water soluble coolants in the early 60[']s, the Plant Engineer experienced the problem of separation of good oil from water solubles when they were mixed. A pond with a dirt floor and dirt walls was created at the north[east]west edge of the plant for holding the water soluble wastes." Source: E.E. Paulson, Plant Engineer. 1970. "Preliminary Report, Waste Disposal, Allegan, Michigan." North American Rockwell Environmental Control Program. July.

The SOS Pond, which may have consisted of two cells at the time of Photograph 1964, is present northwest of the facility. The water level in the pond (which was not constructed in a former backwater area [i.e., after 1938]) appears to be at an elevation that is higher than the backwater areas north of the POTW and north-northeast of the Rockwell facility. The pond appears to be constructed of clean soils as evidenced by the light-toned banks. A dark band, believed to represent oil staining, appears to be present on the banks around the pond at the water surface. This is consistent with the use of the pond to handle oil. There is no visible indication of staining in the backwater area to the east. This is consistent with the fact that there was no outlet from the pond. (Source: Ralph W. Purdy, Michigan Water Resources Commission. 1965. Untitled. D.F. Wilber, Rockwell Standard Corporation. April. With attached Report of Survey.)

- <sup>63</sup> The "pump carts" were wheeled outdoors manually or using a tow motor. (Source: M. Fleming. 1998. Personal communication with Mr. E.E. Paulson, former Rockwell employee, Allegan, Michigan (1964-1974). March.)
- <sup>64</sup> M. Fleming. 1998. Personal communication with Mr. E.E. Paulson, former Rockwell employee, Allegan, Michigan (1964-1974). March.
- <sup>65</sup> When the water-soluble wastes in the SOS Pond broke down and the surface became covered with black oil, "it was routine to fire this surface material and burn it off. The frequency of this operation grew with the increased usage of water-soluble coolants." (Source: E.E. Paulson, Plant Engineer. 1970. "Preliminary Report, Waste Disposal, Allegan, Michigan." North American Rockwell Environmental Control Program. July.)

Mr. Paulson has indicated that the health department or state never required that Rockwell stop burning off of the oil. (Source: M. Fleming. 1998. Personal communication with Mr. E.E. Paulson, former Rockwell employee, Allegan, Michigan (1964-1974). March.)

<sup>66</sup> Correspondence from the Michigan Water Resources Commission, dated April 1965, indicated that although "there is no outlet from the [SOS] pond, there was a certain amount of oil reaching the river from the area. It is the opinion of the writer that the ground has become saturated with oil and oil is now leaching into the Kalamazoo River." The correspondence also states that "[S]ince the daily volume of soluble oil did not appear large, other means of disposal should be explored." (Source: Ralph W. Purdy, Michigan Water Resources Commission. 1965. Untitled. D.F. Wilber, Rockwell Standard Corporation. April. (With attached Report of Survey).)

A Michigan Water Resources Commission memorandum, dated January 1966, stated that "Rockwell had recently hauled in gravelly sand and used the material to build up the pond berm." The memorandum also indicated that the leaching of oil into the river appeared to have been eliminated. (Source: Planning Research Corporation. 1986. "Rockwell Allegan Plant, Responsible Party Search." Draft Report. U.S. Environmental Protection Agency, Office of Waste Programs Enforcement. January 20.) This activity may have accounted for partial elimination of the finger of water adjacent to the pond, increasing the distance between the pond and the river from 15 to 40 feet. However, Mr. Paulson has stated that he believes that construction of an additional dike and filling of the area north of the SOS Pond may have been completed in 1967 (and as observed in Photograph 1967) and that the material used to fill the pond and this former backwater area may have been excavated from beneath the future location of the circa 1969 Manufacturing Complex addition. (Source: M. Fleming and D. Tripp. 1998. Personal communication with Mr. E.E. Paulson, former Rockwell employee. Allegan, Michigan (1964-1974). February and March.)

<sup>67</sup> The need for the new treatment system was presumably based on the increased volume of wastewater generated consistent with the increase in the facility's production, increased environmental awareness at this time, and requests for action from the Water Resources Commission and health department.

<sup>68</sup> The material used to backfill the SOS Pond and associated ponds is believed to be those materials excavated "in front" of the pond to facilitate its movement eastward and material that was excavated from beneath the future location of the Manufacturing Complex addition (including soils potentially affected by the west substation and the temporary bank of transformers)

The use of the material excavated from in front of the pond was likely used to initially backfill the pond(s). (Note: Photograph 1969 indicates the presence of stained materials along the west bank of the Interim Pond.) Mr. Paulson and Mr. Burke recall that the material underlying the area in which the Manufacturing Complex was to be constructed was excavated to a depth of 10 to 12 feet below the ground surface at that time (approximately 25,000 cubic yards of material). Mr. Paulson elected to take this step as older employees at the facility indicated that trash and other materials from the plant had been disposed in the area and that these materials may have had insufficient bearing strength for the planned construction. The excavated material was used to backfill the existing soluble oil pond. (Sources: M. Fleming and D. Tripp. 1998. Personal communications with Mr. E.E. Paulson, former Rockwell employee, Allegan, Michigan (1964-1974), and Mr. Howard Burke, former Rockwell employee, Allegan, Michigan (1940-1975). February.)

Clean fill, which was appropriate for construction purposes, was brought in from offsite to backfill the excavation for the circa 1969 addition to the Manufacturing Complex. (Sources: M. Fleming and D. Tripp. 1998. Personal communication with Mr. E.E. Paulson, former Rockwell employee, Allegan, Michigan (1964-1974). February.) Clean fill was used to backfill the excavation and presumbably to top and grade the area above and proximate to the SOS Pond as supported by the light-toned native soil visible in Photograph 1967.

<sup>69</sup> M. Fleming. 1998. Personal communication with Mr. E.E. Paulson, former Rockwell employee, Allegan, Michigan (1964-1974). March.

<sup>71</sup> The dike was constructed pursuant to: Permit Under the Inland Lakes and Streams Act (Act 291, P.A. 1965, as amended) that was issued to American Rockwell Corporation, September 13, 1968.

Previously, the location of the dike was assumed to extend from the location of the Interim Pond to the northeast and from that point to the southeast with the southeast extension forming the east dike of the WWTP area. Information received from Mr. E.E. Paulson in March 1998 confirms this location (Attachment A). The location of the dike has also been transcribed to Figure 8.

<sup>72</sup> During this period, contact cooling water from Heat Treat was discharged to the WWTP pond area via the north drain, non-contact cooling water was discharged to the Kalamazoo River via the west drain, and wastewater containing non-soluble oil was conveyed to the Oil Flotation House via the east drain.

<sup>73</sup> M. Fleming and D. Tripp. 1998. Personal communication with Mr. E.E. Paulson, former Rockwell employee, Allegan, Michigan (1964-1974). February.

<sup>74</sup> This conclusion is based on the presence of light-toned native soils throughout the north end of the facility in Photograph 1969.

<sup>75</sup> M. Fleming and D. Tripp. 1998. Personal communication with Mr. E.E. Paulson, former Rockwell employee, Allegan, Michigan (1964-1974). February and March.

## 76 Sources:

- Affidavit of Edgar E. Paulson, former Rockwell employee, Allegan, Michigan (1964-1974).
- Affidavit of Howard Burke, former Rockwell employee, Allegan, Michigan (1940-1975).

The location of the transformer (a bank of three transformers was present) has not been documented in the photographs. Mr. Paulson believes that the bank of transformers was a temporary source of power to the western portion of the Manufacturing Complex, which is consistent with the dismantling of the substation in the 1957 addition and construction of a new substation in

<sup>&</sup>lt;sup>70</sup> Photograph 1967.

the circa 1969 addition. (Source: M. Fleming. 1998. Personal communication with Mr. E.E. Paulson, former Rockwell employee, Allegan, Michigan (1964-1974). March.)

<sup>77</sup> This area was the location of the west substation from circa 1946 to circa 1955. Photographs indicate the presence of dark-toned soil proximate to the west substation, suggesting possible staining from oil potentially emanating from the substation/transformers. This area was also the location of the temporary transformer bank that ruptured, spilling dielectric fluids

The excavation of this area and placement of material north of the facility, if affected by PCBs in the dielectric fluids used in the electrical equipment, could account for PCBs detected in some of the environmental samples collected in this area. (Refer also to notes 66 and 68).

<sup>78</sup> The 1967 aerial photograph was not included in Lockheed's evaluation. The photograph was obtained by Meritor in October 1997

<sup>79</sup> The sources of the dark-toned soils are believed to be as follows:

- (1) the dark-toned soil may reflect staining associated with operation of the substation (i.e., oils) or may be indicative of the cinders or asphalt used; Photograph 1964
- (2) the dark-toned soil may reflect a mixture of material, including soils, asphalt, or cinders; the soil may have been affected by oil, specifically oil that may have been present in the materials used to close the soluble oil ponds to the east and to construct the west bank of this pond; Photograph 1969 (Source: PTI Environmental Services. 1998. "Aerial Photographic Interpretation, Allegan, Michigan Site." Meritor Automotive, Inc. Troy, Michigan. March.)
- (3) the dark-toned soil may reflect staining associated with the operation of the rail spur (i.e., oils used for weed and dust control), the Oil Flotation House, or both, or may be indicative of the cinders or asphalt used; Photograph 1964
- (4) operation of the SOS Pond; Photograph 1964 (Source: PTI Environmental Services. 1998. "Aerial Photographic Interpretation, Allegan, Michigan Site." Meritor Automotive, Inc. Troy, Michigan. March.)
- <sup>80</sup> The areas of light-toned native soils, which were frequently identified as "residue" by Lockheed, were areas that frequently underwent subsequent expansion or other site disturbance.
  - Photograph 1964: around the SOS Pond area
  - Photograph 1967: the north end of the facility and around the Interim Pond
  - Photograph 1969: the north end of the facility and the dikes.
- The eastern portion of the backwater area was used, by 1960, as part of the landfill.
- 82 The initial SOS Pond was constructed in an area that was not a backwater area from as early as 1938.
- <sup>83</sup> All of the photographs used were originally dated by a knowledgeable source, except for 1946ca and 1970/1971. Meritor has dated Photograph 1970/1971 based on the presence of the WWTP ponds and the absence of the WWTP Control House. A document dated July 1970 indicates that by that time, the three WWTP ponds and the in-ground holding tanks constructed had been constructed. An update of the document, dated March 1971, indicates that part of the Control House had been constructed by this time. Based on this information, the photograph is believed to represent conditions between July 1970 and March 1971. (Sources: (1) E.E. Paulson, Plant Engineer. 1970. "Preliminary Report, Waste Disposal, Allegan, Michigan," North American Rockwell Environmental Control Program. July. and (2) E. E. Paulson, Plant Engineer. 1971. "Waste Disposal, Allegan, Michigan, Proposal Design Report." March.)

#### 84 Sources:

- Green, James J. 1978. "From Blood-Brothers Machine Company to Rockwell International."
- Environmental Strategies Corporation, McLaren/Hart Inc., PTI Environmental Services. 1998. "Remedial Investigation Report, Former Rockwell International Corporation, Allegan, Michigan Site." Meritor Automotive, Inc. Troy, Michigan. February 9.
- <sup>85</sup> This conclusion is based on the absence of any visible evidence of changed in the photographs or documented evidence of change.
- <sup>86</sup> The wastewaters included: soluble free oil, washers, and lubricants. (Sources: (1) E.E. Paulson, Plant Engineer. 1970. "Preliminary Report, Waste Disposal, Allegan, Michigan." North American Rockwell Environmental Control Program. July. and (2) E. E. Paulson, Plant Engineer. 1971. "Waste Disposal, Allegan, Michigan, Proposal Design Report." March.

Wastewater containing non-soluble oil wastes continued to be handled via the Oil Flotation House. (Source: M. Fleming, 1998. Personal communication with Mr. E.E. Paulson, former Rockwell employee, Allegan, Michigan (1964-1974). March.)

<sup>87</sup> These tanks had a combined storage capacity of 28,000 gallons. (Sources: (1) E.E. Paulson, Plant Engineer. 1970. "Preliminary Report, Waste Disposal, Allegan, Michigan." North American Rockwell Environmental Control Program. July. and (2) E. E. Paulson, Plant Engineer. 1971. "Waste Disposal, Allegan, Michigan, Proposal Design Report." March.

88 Sources:

- E.E. Paulson, Plant Engineer. 1970. "Preliminary Report, Waste Disposal, Allegan, Michigan." North American Rockwell Environmental Control Program. July.
- E. E. Paulson, Plant Engineer. 1971. "Waste Disposal, Allegan, Michigan, Proposal Design Report." March.

89 Sources:

- E.E. Paulson, Plant Engineer. 1970. "Preliminary Report, Waste Disposal, Allegan, Michigan." North American Rockwell Environmental Control Program. July.
- E. E. Paulson, Plant Engineer. 1971. "Waste Disposal, Allegan, Michigan, Proposal Design Report." March.)
- 90 USEPA. 1984. "National Priorities List Ranking Hazardous Ranking Score Package." December 19.
- <sup>91</sup> M. Fleming and D. Tripp. 1998. Personal communication with Mr. E.E. Paulson, former Rockwell employee, Allegan, Michigan (1964-1974). February and March.
- <sup>92</sup> The NPDES Permit for the facility (Permit No. MI0003867) was issued on April 29, 1974. Three outfalls that were permitted (Figure 9):
  - Outfall 001 for the west drain
  - Outfall 002 for the WWTP
  - Outfall 003 for the east drain.

Discharges from Outfalls 001 and 003 were rerouted to Outfall 002 in late 1974, and the permits for Outfalls 001 and 003 were rescinded by December 30, 1974.

- <sup>93</sup> Environmental Strategies Corporation, McLaren/Hart Inc., PTI Environmental Services. 1998. "Remedial Investigation Report, Former Rockwell International Corporation, Allegan, Michigan Site." Meritor Automotive, Inc. Troy, Michigan. February 9.
- 94 Green, James J. 1978. "From Blood-Brothers Machine Company to Rockwell International."
- <sup>95</sup> M. Fleming. 1998. Personal communication with Mr. E.E. Paulson, former Rockwell employee, Allegan, Michigan (1964-1974). March.

An estimated 9,000 yd<sup>3</sup> of material from the rail embankment was excavated and used in this manner.

The railroad right-of-way was deeded to Rockwell in 1974. (Source: Deed. 1974. The Chesapeake and Ohio Railway Company and Rockwell International Corporation. August 23.)

<sup>96</sup> Fill material was brought in from offsite to bring the area of construction for these buildings to a higher elevation. Fill was also used to increase the elevation of the ground surface east of the Manufacturing Complex and overlying the former rail spur. (Source: M. Fleming. 1998. Personal communication with Mr. E.E. Paulson, former Rockwell employee, Allegan, Michigan (1964-1974). March)

The rail shipping and receiving buildings and Oil Flotation House above ground structure were removed between 1972 and 1973.

- <sup>97</sup> Environmental Strategies Corporation, McLaren/Hart Inc., PTI Environmental Services. 1998. "Remedial Investigation Report, Former Rockwell International Corporation, Allegan, Michigan Site." Meritor Automotive, Inc. Troy, Michigan. February 9.
- <sup>98</sup> Environmental Strategies Corporation, McLaren/Hart Inc., PTI Environmental Services. 1998. "Remedial Investigation Report, Former Rockwell International Corporation, Allegan, Michigan Site." Meritor Automotive, Inc. Troy, Michigan. February 9.
- <sup>99</sup> The following items of interest were reviewed by PTI based on identification by Lockheed in Photograph 1974:
  - The cinder-covered drive along the northwest corner of the facility was misidentified as a "stain" by Lockheed. (Source: Lockheed Engineering and Management Services Company, Inc. 1986. "Aerial Photographic Analysis of the Rockwell International Site, Allegan, Michigan." U.S. Environmental Protection Agency. TS-AMD-86710-12.)

100 The source of the dark-toned soils is believed to be:

- (1) and (2) the dark-toned soil may reflect facility operations or may be indicative of the cinders or asphalt used;
   Photograph 1974 (Source: Lockheed Engineering and Management Services Company, Inc. 1986. "Aerial Photographic Analysis of the Rockwell International Site, Allegan, Michigan." U.S. Environmental Protection Agency. TS-AMD-86710-12.)
- (3) the dark-toned soil may be indicative of materials storage and handling in this area; Photograph 1970/1971

The areas of light-toned native soils, which were frequently identified as "residue" by Lockheed, were areas that frequently underwent subsequent expansion or other site disturbance.

- Photograph 1955: northeast of facility (identified by Lockheed as "solid material")
- Photograph 1960: northeast of facility; edge of bank around cinder area; East Lot
- Photograph 1960: east of rail spur (see Photographs 1946, 1957, and 1964).
- <sup>101</sup> The areas of light-toned native soil, were typically observed in locations that had recently undergone expansion.
  - Photograph 1970/1971: northwest, north, and northeast of the facility
  - Photograph 1973: northeast and east of the facility and north of the West Lot
  - Photograph 1974: east and northeast of the facility. The area identified by Lockheed as residue or some type of fill material is believed to be light-toned native soils.
- <sup>102</sup> Photographs 1970/1971, 1973, and 1974. Identified as "residue or solid waste" by Lockheed in Photograph 1974.
- 103 Photograph 1974.
- <sup>104</sup> Environmental Strategies Corporation, McLaren/Hart Inc., PTI Environmental Services. 1998. "Remedial Investigation Report, Former Rockwell International Corporation, Allegan, Michigan Site." Meritor Automotive, Inc. Troy, Michigan. February 9.
- <sup>105</sup> M. Fleming. 1998. Personal communication with K&D Industries. March.
- <sup>106</sup> Tires are still present at the facility both outdoors (north of the main building [Manufacturing Complex]) and indoors (in the former Heat Treat area).
- Mr. Lyle Bush, who has been employed at the POTW since the 1970s, and Mr. Dwight Fargo, Supervisor of the POTW, have stated that the material underlying and proximate to the clarifiers constructed in 1976/1978 was excavated and moved into other areas. Mr. Bush indicated he believed the material was moved both to the north of the clarifiers and south of North Street. Mr. Fargo concurred with the movement of the excavated material south of North Street. These materials were apparently moved to allow for the placement of soils more suitable for construction of the new facility.
- 108 Secondary treatment includes:
  - chemical treatment for phosphorus removal
  - settling of solids from the effluent in clarifiers
  - biological digestion of organic materials/treatment (disinfection) of water prior to discharge via the outfall to the Kalamazoo River
  - periodic monitoring of the outfall
  - transfer of the clarified sludge to offsite property for drying or disposal.
- <sup>109</sup> Environmental Strategies Corporation, McLaren/Hart Inc., PTI Environmental Services. 1998. "Remedial Investigation Report, Former Rockwell International Corporation, Allegan, Michigan Site." Meritor Automotive, Inc. Troy, Michigan. February 9.
- <sup>110</sup> Photograph 1970/1971 indicates that Pond No. 1 was darker in appearance than Pond Nos. 2 and 3. This is consistent with the placement of the Interim Pond materials in Pond No. 1.
- 111 Sources:
  - M. Fleming. 1998. Personal communication with Mr. Richard Haskins, former Rockwell employee (1947-1973).
     March.
  - M. Fleming and D. Tripp. 1998. Personal communication with Mr. E.E. Paulson, former Rockwell employee (1964-1974). February.
  - Environmental Strategies Corporation, McLaren/Hart Inc., PTI Environmental Services. 1998. "Remedial Investigation Report, Former Rockwell International Corporation, Allegan, Michigan Site." Meritor Automotive, Inc. Troy, Michigan. February 9.
- <sup>112</sup> Environmental Strategies Corporation, McLaren/Hart Inc., PTI Environmental Services. 1998. "Remedial Investigation Report, Former Rockwell International Corporation, Allegan, Michigan Site." Meritor Automotive, Inc. Troy, Michigan. February 9.
- <sup>113</sup> PTI Environmental Services. 1998. "1997 Reconnaissance of Subsurface Soils and Groundwater conditions in the Vicinity of the Former Soluble Oil Separation Pond." Meritor Automotive, Inc. March.
- Environmental Strategies Corporation, McLaren/Hart Inc., PTI Environmental Services. 1998. "Remedial Investigation Report, Former Rockwell International Corporation, Allegan, Michigan Site." Meritor Automotive, Inc. Troy, Michigan. February 9.

<sup>&</sup>lt;sup>115</sup> Anderson, K. 1998. "Kalamazoo River Study Group v. Rockwell International Corporation, Expert Report of Kim E. Anderson, Ph.D. for Defendant Rockwell International." Mr. Joseph Basta, Dykema Gossett. January 13.

Anderson, K. 1998. "Kalamazoo River Study Group v. Rockwell International Corporation, Expert Report of Kim E. Anderson, Ph.D. for Defendant Rockwell International." Mr. Joseph Basta, Dykema Gossett. January 13.

<sup>&</sup>lt;sup>117</sup> Anderson, K. 1998. "Kalamazoo River Study Group v. Rockwell International Corporation, Expert Report of Kim E. Anderson, Ph.D. for Defendant Rockwell International." Mr. Joseph Basta, Dykema Gossett. January 13.

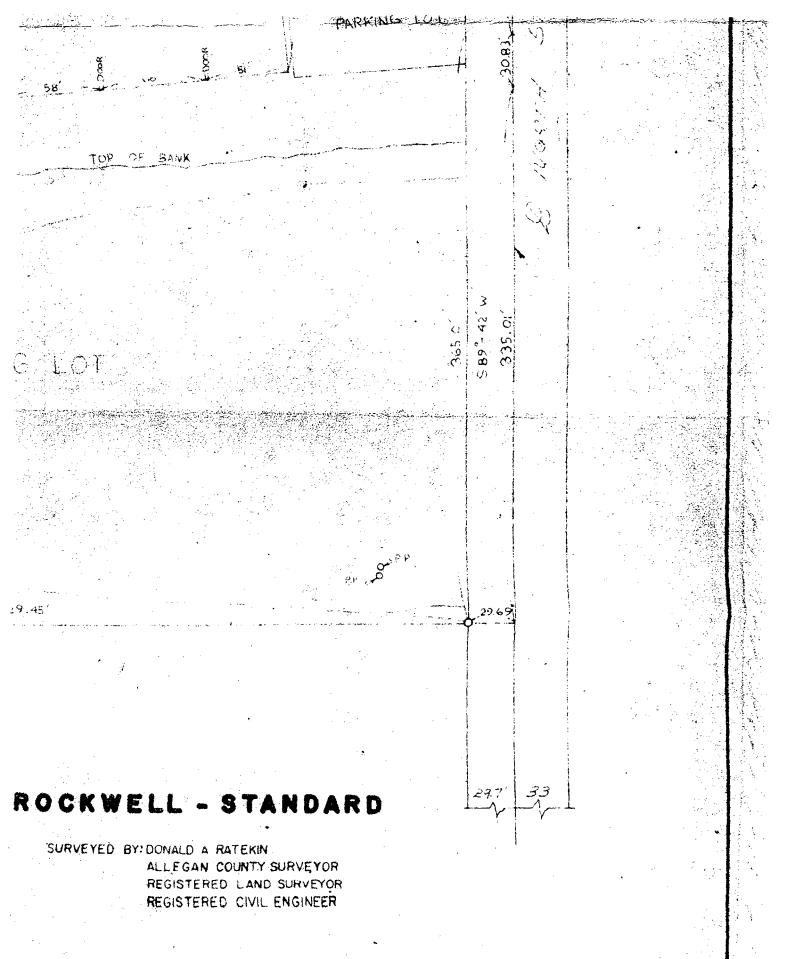
<sup>&</sup>lt;sup>118</sup> Anderson, K. 1998. "Kalamazoo River Study Group v. Rockwell International Corporation, Expert Report of Kim E. Anderson, Ph.D. for Defendant Rockwell International." Mr. Joseph Basta, Dykema Gossett. January 13.

<sup>119</sup> Environmental Strategies Corporation, McLaren/Hart Inc., PTI Environmental Services. 1998. "Remedial Investigation Report, Former Rockwell International Corporation, Allegan, Michigan Site." Meritor Automotive, Inc. Troy, Michigan. February 9.

<sup>&</sup>lt;sup>120</sup> PCBs were commonly used in the production of pesticides.

Environmental Strategies Corporation and McLaren/Hart, Inc. 1998. "Remedial Investigation Report, Former Rockwell International Corporation, Allegan, Michigan Site, Supplemental Response to Comments. Meritor Automotive, Inc. March 9.

# Attachment A



Page 1

Only the Westlaw citation is currently available.

United States District Court, W.D. Michigan.

KALAMAZOO RIVER STUDY GROUP, Plaintiff, v. ROCKWELL INTERNATIONAL, et al.,

Defendants.

#### No. 1:95-CV-838.

June 30, 1998.

Alan C. Bennett, Law, Weathers & Richardson, Bridgewater Pl., Grand Rapids, MI, Kent, Jerome T. Wolf, <u>James Lee Moeller</u>, Sonnenschein Nath & Rosenthal, Kansas City, MO, for Kalamazoo River Study Group, pltf.

<u>Joseph C. Basta</u>, Dykema Gossett, PLLC, Detroit, MI, Wayne, for Rockwell International Corporation, deft.

<u>Kathryn J. Humphrey</u>, <u>Joseph C. Basta</u>, (See above), Dykema Gossett, PLLC, Detroit, MI, Wayne, for Eaton Corporation, deft.

<u>Joseph C. Basta</u>, Dykema Gossett, PLLC, Detroit, MI, Wayne, for Rockwell International Corporation, counter-claimant.

Alan C. Bennett, Law, Weathers & Richardson, Bridgewater Pl., Grand Rapids, MI, Kent, Jerome T. Wolf, <u>James Lee Moeller</u>, Sonnenschein Nath & Rosenthal, Kansas City, MO, for Kalamazoo River Study Group, counterdeft.

Joseph C. Basta, Dykema Gossett, PLLC, Detroit, MI, Wayne, for Rockwell International Corporation, counter-claimant.

Alan C. Bennett, Law, Weathers & Richardson, for Kalamazoo River Study Group, counterdeft.

## **OPINION**

BELL, J.

\*1 This matter comes before the Court on crossmotions for summary judgment on the issue of liability filed by Plaintiff Kalamazoo River Study Group ("KRSG") and Defendants Rockwell International and Eaton Corporation. I.

Plaintiff KRSG filed this action under sections 107(a) and 113(f) of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. § § 9607(a) & 9613(f), seeking relief from eight corporations for the study and remediation of polychlorinated biphenyl ("PCB") contamination at the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site (the "Site").

In a previous opinion issued in this case this Court determined that CERCLA does not permit a § 107 claim by one potentially responsible party ("PRP") against other PRPs for joint and several liability. [FN1] In another opinion addressing cross-motions for summary judgment filed by Plaintiff and Defendants Menasha Corporation, Pharmacia and Upjohn Company, and Rock-Tenn Company, Mill Division, Inc., [FN2] this Court outlined the background of this case and set forth the legal standards that would be applied in evaluating Plaintiff KRSG's claims. In that opinion, which is incorporated herein by reference, this Court articulated the standard it would apply for testing the liability of the defendants in this action as the "threshold of significance" standard: is the evidence of defendant's release of PCBs of sufficient significance to justify holding defendant liable for response costs?

<u>FN1.</u> Opinion dated January 16, 1998, Docket # 642.

<u>FN2.</u> Opinion dated March 6, 1998, Docket # 689.

H.

Under Rule 56(c) of the Federal Rules of Civil Procedure, summary judgment is proper if there is no genuine issue as to any material fact and the moving party is entitled to judgment as a matter of law. "In assessing the record to determine whether there is any genuine issue of material fact, the court must resolve all ambiguities and draw all factual inferences in favor of the non-moving party." Wathen v. General Elec. Co., 115 F.3d 400, 403 (6th Cir.1997) (citing Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 255 (1986)). The mere existence of a scintilla of evidence in support of Plaintiff's position is not

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sufficient to create a genuine issue of material fact. Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 252 (1986). The nonmoving party must do more than show that there is some metaphysical doubt as to the material facts. Matsushita Elec. Indus. Co. v. Zenith Radio Corp., 475 U.S. 574, 586 (1986). The mere possibility of a factual dispute is not enough. Hartsel v. Keys, 87 F.3d 795, 799 (6th Cir.1996). The nonmoving party must present evidence on which the trier of fact could reasonably find in its favor. Id.

Ш

Plaintiff KRSG has moved for summary judgment on the issue of Defendant Rockwell's liability. In support of this motion KRSG relies on evidence that Rockwell has a history of releasing oily wastes into the Kalamazoo River, and evidence that PCBs have been found in all of the oil handling areas.

\*2 Defendant Rockwell opposes KRSG's motion and moves for summary judgment in its own favor. Rockwell contends that the evidence is insufficient to support a finding of liability as a matter of law. Defendant Rockwell does not deny the presence of PCBs on its site. Neither does it deny the release of oily wastes into the Kalamazoo River. Rockwell contends, however, that there is no evidence that it has released any PCBs into the River, much less that it released sufficient quantities of PCBs to meet the threshold of significance.

The underlying evidence is not contested. Since 1914 Defendant Rockwell International has owned property and a manufacturing plant at 1 Glass Street, Allegan. The property is on the Kalamazoo River downstream from the National Priorities List ("NPL") Site, but within the 95-mile stretch of the Kalamazoo River that KRSG has agreed to study pursuant to the Administrative Order by Consent ("AOC").

From 1953 through 1988 Rockwell manufactured automotive parts at the Allegan plant, including universal joints and driveline parts for heavy trucks and construction equipment. The manufacturing process (forging, machining and heat treating metal parts) involved the use of straight cutting oils, water soluble oils, quench oils, cooling oils, and hydraulic oils. Rockwell's manufacturing process generated thousands of gallons of oil-containing wastes.

Prior to 1945, Rockwell discharged its process wastewater with little or no treatment directly into the Kalamazoo River. In 1945, in response to concerns raised by the Michigan Department of Conservation, Rockwell built the Oil Floatation House, also referred

to as the "Hog House", to separate oils from the plant's process wastewater before it was discharged into storm drains and into the Kalamazoo River.

In 1960 Rockwell began discharging industrial wastewater into a new, unlined collection pond known as the Soluble Oil Separation ("SOS") Pond. The SOS Pond was 15 feet from the Kalamazoo River. In 1965 the Michigan Water Resources Commission ("MWRC") survey concluded that Rockwell's oil was reaching the river as a result of leaching from the SOS Pond and as a result of discharges from the Oil Floatation House. By 1970 Rockwell acknowledged that ponds constructed of dirt dikes were unsatisfactory due to saturation of the dike walls and sub- soil seepage. In 1974 the SOS Pond was filled in.

Due to continued complaints from the MWRC, in 1971 Rockwell constructed a wastewater treatment plant ("WWTP") consisting of six underground storage tanks and three treatment ponds located next to the River. In 1973 oils appeared to be seeping into the river through the banks of the new treatment ponds. Oil booms were installed across the width of ponds # 1 and # 2. In the mid-1970's Rockwell installed two oil booms in the river to control continued seepage problems.

The EPA's testing of the area in 1984 revealed the presence of lead, arsenic, cyanide, and solvents in the ground water near the oil recovery wells and lead in the water being discharged into the river. In 1987 the EPA added the Rockwell facility to the National Priorities List as a Superfund Site. Rockwell signed an AOC in 1988, and agreed to conduct a Remedial Investigation/Feasibility Study ("RI/FS") at the site.

\*3 Rockwell's wastewater effluent was tested by the Michigan Department of Natural Resources in 1976 and 1986, and both tests were negative for PCBs. However, in 1990 and 1992, in the course of conducting its RI/FS, Rockwell's environmental consultants, Environmental Strategies Corporation ("ESC") detected PCBs in ground water, light non-aqueous phase liquid ("LNAPL"), soil and sediment, taken from the areas of the Oil Floatation House, the SOS Pond, and the WWTP Ponds Nos. 1, 2, and 3. The samples showed PCB concentrations as high as 1600 parts per billion ("ppb"), 900 ppb, 620 ppb, and 440 ppb. [FN3]

<u>FN3.</u> In order to give some meaning to the levels discussed in this opinion, the Court makes note of the testimony of Plaintiff's

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expert, Dr. Brown, that certain background levels of PCBs (roughly 10 ppb for sediments and 1 ppb for soil) can be expected due to the atmospheric deposition process.

In October 1996, Rockwell's consultant took a soil sample from the river bank at the end of the former discharge line from the Oil Floatation House which confirmed the presence of PCBs at 35 ppm (35,000 ppb). This sampling result, found within a foot or two of the River's edge, was described by the EPA as a high level of PCB contamination. The pattern of PCBs found at this location was not consistent with the PCBs upstream or downstream. Rockwell's consultant, Robert C. Barrick, concluded that the River was not a source of the PCBs at this location; instead, these PCBs were most likely associated with the outfall pipe from the Oil Floatation House.

Defendant Rockwell notes that PCBs were only found in 13 out of 111 soil samples. Plaintiff, however, has come forward with evidence that PCB contamination was found in all of Rockwell's oil handling areas.

Although there is ample evidence of PCBs on Rockwell's property, no one with personal knowledge has been able to pinpoint the origin of the PCBs. Some of the possible sources of the PCBs include dielectric fluids in Rockwell's electrical equipment, fill dirt from a nearby landfill, or PCBs in the oils used by Rockwell.

The release of PCBs associated with electrical equipment or fill dirt are arguably incidental, and no effort has been made to trace the PCBs from such sources to the Kalamazoo River. The focus in this case has accordingly been directed to the issue of whether Rockwell used PCBs in its process oils.

There is no direct evidence that Rockwell used any oils containing PCBs as additives. There is no evidence that Rockwell purchased PCB-containing oils, and none of the Rockwell employees had any recollection of using PCB-containing oils. Rockwell asserts that it did not conduct any operations at the facility which historically have been associated with PCBs, and had no incentive to use oils with PCBs. Rockwell conducted no forging, die casting or other extremely high temperature operations that might have benefitted from the fire-resistant qualities of PCB-containing oil. Moreover, oils with PCBs were more expensive, had an unpleasant odor, and were irritating to the workers' skin. According to

Rockwell, if there were PCBs in the process oils, they are only attributable to unintentional trace contamination.

Rockwell has also presented evidence developed through gas chromatography that the "fingerprint" of PCBs detected on the Rockwell property does not match the "fingerprint" of the PCBs found in the Kalamazoo River. The dominant Aroclor mixture found on Rockwell's property is Aroclor 1254, while the dominant Aroclor mixture found in the River, both upstream and downstream of the Rockwell facility, is Aroclor 1242.

\*4 Despite the lack of direct evidence that Rockwell used PCB-containing process oils, PCBs have been found in the subsurface waste oils (LNAPL) floating on the groundwater in the vicinity of Rockwell's oil treatment areas. Rockwell's consultants have described the LNAPL as a mixture of Rockwell's cutting oils and hydraulic oils.

Viewing the facts in the light most favorable to Plaintiff KRSG, there is evidence in the record to support Plaintiff's contention that the steady release of PCBs to the River can be inferred from the fact that for the past 10 years environmental samples taken by Rockwell and its consultants have confirmed PCB contamination in those areas where Rockwell's oily wastewaters were handled, treated and discharged to the river.

Viewing the facts in the light most favorable to Defendant Rockwell, the Court finds some merit to Rockwell's contention that there is insufficient evidence of its use of PCB-containing oils to support a reasonable inference that it discharged PCBs in its oily wastes to the Kalamazoo River, at least not in any measurable quantity or with any regularity.

Upon review of all the evidence presented on these cross-motions for summary judgment, the Court concludes that whether the PCBs found at Rockwell's Allegan facility indicate only incidental PCB contamination from discrete sources, or whether they indicate that Rockwell made regular use of PCB-containing oils in its process oils that were released with its wastewater into the Kalamazoo River, is a question of fact that merits further development at trial. This is not an issue that is appropriate for resolution on summary judgment. Accordingly, the cross-motions for summary judgment as to liability filed by Plaintiff KRSG and by Defendant Rockwell will be denied.

Also before this Court is a motion for summary judgment on the issue of liability filed by Defendant Eaton Corporation. Eaton contends that there is no evidence to support Plaintiff's contention that Eaton is responsible for PCB contamination of the Kalamazoo River.

Plaintiff KRSG opposes Eaton's motion and moves for summary judgment in its own favor. Plaintiff contends that there is no question that Eaton used process oils containing PCBs at each of its facilities and that wastewaters containing those oils for a considerable period of time were discharged directly into storm and sanitary sewers that further discharged directly to the Kalamazoo River.

Eaton manufactures parts for the automotive industry. Three Eaton facilities are at issue in this motion: the Marshall, Battle Creek, and Kalamazoo facilities. None of these three facilities is located next to the River.

A.

The Eaton Torque Control Products Division plant is located in Marshall, Michigan, approximately 30 miles upstream of the most upstream part of the Site. It is located approximately one-quarter mile from the Kalamazoo River. The Marshall facility machines, grinds, heat-treats and assembles components for the transportation industry. It is still in operation.

\*5 There is evidence that in 1980 PCBs were detected in a single sample of the effluent from the Marshall facility at a level of 0.82 ppb. Despite additional sampling, no further PCBs were detected. In 1981 Eaton inventoried all incoming products at the Marshall plant for PCBs. No PCBs were found. The MDNR agreed that no further PCB monitoring was necessary because the Marshall plant did not use PCBs.

Other than the one 1980 sample, no PCBs were found in wastewater tested in 1973, 1980, 1981 and 1983. The quench oils, hydraulic oils and waste oils at the Marshall plant were tested by the MDNR in 1985, and no detectable levels of PCBs were found.

Sampling of riverbed sediments and settleable solids for almost 20 miles downstream of the Marshall plant have not revealed any detectable levels of PCBs.

B.

Eaton's former Valve Division plant was located at

463 North 20th Street, Battle Creek, approximately one-half mile from the Kalamazoo River, and approximately 15 miles upstream of the Site. Eaton manufactured internal combustion engine valves and gears at the Battle Creek plant from the 1940s until 1983 when operations were ceased.

The outfall from the Battle Creek plant to the Kalamazoo River was shared with Clark Equipment Company and three municipal storm sewers. In February 1972 a wastewater sample from the joint outfall revealed PCBs of 1400 ppb. A September 1972 study of the wastewater at Eaton's facility found PCBs at 0.24 ppb and 0.12 ppb. The samples were taken from a storm sewer that drained areas outside of the Eaton facility as well as areas within the Eaton facility.

In 1981 VERSAR, an environmental consultant, inspected the Battle Creek plant to determine compliance with PCB disposal and marking regulations. VERSAR found some PCBs leaking from transformers. VERSAR also found PCBs in the swarf (grinding sludge) at a level of 7 ppm. VERSAR sampled cutting, quench and hydraulic oil in the plant, however, and found no detectable levels of PCBs in any of those oils.

In 1983, after the plant was shut down, the wood block floor was tested for PCBs. PCBs were found to be present in all wood block sampled. Approximately 20 percent of the samples had PCB levels of greater than 50 ppm, the level at which the EPA requires special disposal.

The MDNR tested sediments downstream of the former Battle Creek plant in 1988. Of the eleven sampling stations, all but one were non-detect for PCBs, and the remaining one was at the detection limit of 1 ppm. That single detection occurred more than a mile downstream of the Battle Creek plant.

A Monsanto document found in the MDNR files indicates Monsanto sales of Pydraul, a PCB-containing hydraulic oil, to a number of customers, including Eaton's Battle Creek plant. The document indicates that Monsanto sold Eaton 1940 pounds of Pydraul in 1970, 645 pounds in 1971, and 1080 pounds in 1972.

C.

The Eaton Corporation Transmission division plant is located at 222 Mosel Avenue, Kalamazoo, Michigan. Eaton manufactured truck transmissions at the Kalamazoo facility from the mid-1950's until

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January 1984, when the plant was shut down. The plant was located approximately one-half mile from the Kalamazoo River.

\*6 The wastewater from the Kalamazoo plant was tested by the MDNR in 1973 and 1976. No PCBs were detected. There is no evidence in the record of any sample of water, soil or wastewater effluent which has detected PCBs at the Kalamazoo plant.

Wastewater from the Kalamazoo plant was discharged via the Zantman Drain to the Kalamazoo River. [FN4] The Zantman Drain is an open culvert draining upstream farmlands and is accessible to several industrial properties near Eaton. There is no testing or sampling indicating detectable levels of PCBs anywhere along the Zantman Drain between the Eaton facility and the River.

FN4. Until the early 1960's the Zantman Drain discharged directly into the Kalamazoo River through the Richardson Drain. No oils were removed from Eaton's discharge to the Zantman Drain until the late 1960s, when an oil skimmer was installed. From the mid-1960s to early 1970s the Zantman Drain terminated in a marshy area. In the early 1970s the Zantman Drain's connection to the Kalamazoo River was reestablished.

When the Kalamazoo plant was sold in 1985, an environmental due diligence investigation was performed by an environmental consultant, GZA, retained by the purchaser. The only PCBs located at the Kalamazoo plant were those found in the wood block flooring. Eaton's expert, Dr. Lennard Wharton, has indicated that the PCBs in the flooring were localized in four areas of the floor where PCB-containing electrical power distribution equipment had been located. There were no significant concentrations in the vicinity of the quench baths or the machine tool areas where cutting fluids would have been used.

V.

Plaintiff boldly asserts that the evidence conclusively demonstrates that the process oils used by Eaton contained PCBs, and that those PCB-containing process oils were discharged to the Kalamazoo River in "huge quantities" until the late 1960s or early 1970s.

Defendant Eaton does not deny that there were PCBs in the electrical equipment at each of the three plants. There is no evidence, however, of PCB leaks from the electrical equipment at the Marshall plant and there is no evidence that any PCB leaks from the electrical equipment at the Battle Creek and Kalamazoo plants made their way into wastewater or outside soil and from there to the Kalamazoo River.

Plaintiff KRSG does not attempt to show that leaks from electrical equipment resulted in PCB contamination of the River. Plaintiff focuses instead on its claim that there were PCBs in Eaton's process oils (quench, hydraulic and cutting oils). Defendant Eaton does not deny that process oils likely escaped in wastewater and may have been discharged to the River. Therefore, the central issue raised by these cross-motions for summary judgment is whether, viewing the evidence in the light most favorable to Plaintiff, and drawing all reasonable inferences in Plaintiff's favor, a trier of fact could reasonably conclude that Eaton's process oils contained PCBs.

There is no testimony from anyone with personal knowledge that Eaton ever used PCB-containing oils in its processes. There is no evidence of any test results showing the presence of PCBs in the fluids used in the Eaton plants. There is no testimony that Eaton engaged in activities that required PCB additives. PCBs are most commonly found in the oils used in die casting operations. Eaton did not have a die casting operation. The evidence is uncontroverted that Eaton had no incentive for using PCBs in its process oils because the PCBs would have added unnecessary costs, without any corresponding benefit. In fact, there was a disincentive for using PCBs because they were poorer in performance than other cutting oils, had unpleasant odors, and were irritating to the skin.

\*7 Despite the lack of direct evidence of PCBs in Eaton's process oils, Plaintiff's expert, Dr. Kenneth Crumrine, has opined that "PCBs were present in at least one or more of the cutting oils, hydraulic oils and quench oils" used by Eaton. Dr. Crumrine's opinion is built largely on the statements of Eaton's environmental engineers, the statements of a former MDNR engineer, EPA studies regarding the types of oils used in the industry, and the PCB contamination of Eaton's wood block floors.

Plaintiff argues that Eaton has "admitted" that its process oils contained PCBs because its director of environmental engineering testified that some process oils "in fact" contained PCBs. Plaintiff overstates the evidence.

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Stuart Lightfoot, Eaton's director of environmental engineering, testified that he suspected that the sources of the PCB contamination at the Battle Creek facility were leaking capacitors and transformers, and possibly a heat treat oil quench operation "Possibly heat treat quench oil, if there was any used We had no knowledge there was any PCBs in the quench oils but, I mean, it could be "Lightfoot dep p 153"

Ken Manchen, one of Eaton's environmental engineers, speculated that the PCB contamination at the Battle Creek facility was attributable to PCB-containing hydraulic oils used during the war years Manchen did not have any independent knowledge that PCB-containing hydraulic oils had been used As Manchen testified, in forming his opinion he relied on a theory voiced by Lightfoot Manchen dep pp 73-74

With respect to the Kalamazoo facility, Mr Lightfoot testified that he thought the cause of the PCB contamination on the floors was a dripping spigot on an internal wet transformer, and a heat treat oil quench operation *Id* at 173-75 Because the Kalamazoo facility heat treat department did not have automatic fire extinguishers on it, Lightfoot presumed the facility had built- in fire extinguishers in the PCB oils *Id* at 175 That was his best "guesstimate" *Id* at 179 Lightfoot interjected, however, that there were other fire retardant methods in quench oil besides PCB, and no investigation had been done to determine which methods were used *Id* at 197

Thomas Newell, a former MDNR engineer, noted that PCBs were commonly contained in the oils used in the automobile parts manufacturing industry. He testified that based upon his experience many of the oils used in the industry are recycled, and recycled oils may tended to contain trace PCB contaminants, even into the 1980s. Newell, however, did not have any specific knowledge about the oils used at any of Eaton's facilities. Moreover, his opinion that the PCBs in the Marshall plant's effluent likely came from PCB-containing process oils was based upon his inaccurate assumption that Eaton had a die casting operation. Newell's general knowledge about the automobile parts manufacturing industry is not probative of what occurred at Eaton.

\*8 In his affidavit Dr Crumrine indicates that his opinion "is also based on the type of oils used at the facilities as documented by the Environmental Protection Agency, whose studies determined that such oils contain PCBs "

Plaintiff's expert did not base his opinion on an EPA report documenting the oils used at Eaton's facilities Neither did he base his opinion on any personal knowledge about the oils used by Eaton or on a report about what was standard in the automobile parts manufacturing industry He apparently relied on the May 1972 Interdepartmental Task Force on PCBs report on Polychlorinated Biphenyls and the Environment That report notes that PCBs are found in hydraulic fluids, but cautions that "[n]o definite knowledge is available that PCBs are present in commercial hydraulic fluids Since composition specifications of these fluids are usually not available to the public, PCB content should be established by chemical composition " Id at 53 The report also notes that some of the "more interesting and nonconventional uses" of PCBs are as a metal quencher, or as an aid to fusion cutting of stacked metallic plates *Id* at 65-66

There is no general report indicating that PCBs were necessarily or even probably used in the process oils facilities like Eaton's Without further corroborating evidence, the general report that PCBs could sometimes be found in cutting, quenching and hydraulic oils, is of little probative value on the issue of what process oils were used by Eaton At most it supports the possibility that PCBs could have been found in Eaton's process oils It does not support a probability that Eaton's process oils contained PCBs In the absence of some corroborating evidence or a high degree of statistical certainty, a general study such as the EPA report cannot be used to draw conclusions in specific cases See Textron Inc v Barber-Colman Co., 903 F Supp 1546, 1557 (WDNC 1995)

Plaintiff contends that the distribution pattern of PCBs in the wood block floors from the Battle Creek and Kalamazoo facilities demonstrates that there were PCBs in the process oils used at these facilities

Dr Wharton has charted the location and levels of the PCBs found in the wood block floor at the Kalamazoo plant. He observed that the only places where PCBs were found at concentrations of 50 ppm or more were where there was known placement of PCB containing electrical power distribution equipment. If there had been PCBs in the quench, cutting or hydraulic oils, high concentrations of PCBs would have been found in the areas where those operations were carried out. Instead, he found only insignificant PCB concentrations in those areas.

Plaintiff's expert, Dr Mark Brown, concedes that

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there appears to be a correlation at least with the highest PCB levels and the location of transformers. Brown dep. 1/8/98 pp. 192-93. Dr. Brown testified that the distribution of PCBs in the wood block flooring "suggests that there are as likely alternate hypotheses to the hypotheses that distribution simply reflects people tracking around and operations tracking around PCBs that lead from transformers and capacitors." *Id.* at 192. However, he was unable to conclude that the PCBs in the floor more likely came from process oils than from transformers or capacitors. In his opinion they were "equally plausible hypotheses." *Id.* 

\*9 The wood floor from the Battle Creek plant showed more widespread contamination than the floor from the Kalamazoo plant. Dr. Crumrine testified that in his experience with PCB releases from electrical equipment such as capacitors and transformers, he had never seen floor patterns of contamination like that found at the Battle Creek plant. In Dr. Crumrine's opinion, such pervasive contamination of an area cannot be attributed to leaks from electrical equipment, and therefore must be associated with PCB-containing process oils.

Dr. Crumrine's conclusion that PCBs were used in the process oils at the Battle Creek plant is also based on some additional factors that were not present at the other two Eaton plants. At the Battle Creek plant there is evidence of the purchase of Pydraul, a PCB-containing hydraulic oil, in 1970, 1971 and 1972, and a contemporaneous detection of PCBs in the wastewater. There is also evidence of PCBs in the grinding sludge in 1981.

Upon consideration of all the evidence, the Court concludes that Plaintiff has not come forward with sufficient probative evidence to show that the Marshall plant released PCBs to the Kalamazoo River. The only evidence Plaintiff has come forward with for the Marshall plant is a single test result of effluent that could not be repeated. A single detection of PCBs in Marshall's wastewater is not a sufficient basis on which to premise liability, particularly where, as here, the single positive test result is not supported by any evidence of PCBs in the sediment downstream of the Marshall plant. "[O]ne test is not a sufficient basis for extrapolation absent additional evidence which establishes that those results are a reliable indicator of typical discharges." Textron, Inc. v. Barber-Colman Co., 903 F.Supp. 1546, 1555 (W.D.N.C.1995). "It is unsound scientific practice to select one concentration measured at a single location and point in time and apply it to describe continuous releases of contamination of any 11-year period."

<u>Renaud v. Martin Marietta Corp.</u>, 749 F.Supp. 1545, 1553 (D.Colo.1990), aff'd, 972 f.2d 304 (10th Cir.1992).

The Court also concludes that Plaintiff has not come forward with sufficient probative evidence to show that the Kalamazoo plant released PCBs to the Kalamazoo River. There is no more than a scintilla of evidence that there were PCBs in the process oils at the Kalamazoo facility. The evidence is limited to the speculation of Eaton employees regarding the possibility that PCBs were added to the quench oils, and the opinion of Dr. Brown that PCBs in process oils was an "equally plausible" explanation for the PCBs in the wood floor. Plaintiff carries the burden of proving liability in this case. Plaintiff has not presented sufficient evidence with respect to the Kalamazoo facility from which the trier of fact could reasonably find in its favor.

Eaton's motion for summary judgment with respect to the Marshall and Kalamazoo facilities will be granted.

\*10 The Battle Creek facility presents the Court with a more difficult question. Plaintiff's evidence of the use of PCBs in the process oils at the Battle Creek facility is undoubtedly slim. The evidence is mostly speculative and conjectural. Nevertheless, viewing the evidence in the light most favorable to Plaintiff, and drawing all inferences in Plaintiff's favor, the Court is constrained to conclude that Plaintiff has come forward with sufficient evidence to create an issue of material fact for trial. However, it would appear to this Court at this juncture that this evidence, without more, is not likely to be sufficient at trial where the Court will be in a position to weigh the evidence to determine whether Plaintiff has shown, by a preponderance of the evidence, that Eaton has released PCBs to the Kalamazoo River and that its release was of sufficient significance to justify holding Eaton liable for response costs. Eaton's motion for summary judgment with respect to the Battle Creek facility will be denied. KRSG's crossmotion for summary judgment will also be denied.

VI.

For the reasons stated above, Rockwell and KRSG's cross-motions for summary judgment will be denied. Eaton's motion for summary judgment will be granted as to the Marshall and Kalamazoo facilities, and will be denied as to the Battle Creek facility. KRSG's cross-motion regarding Eaton will be denied.

An order consistent with this opinion will be entered.

#### **ORDER**

In accordance with the opinion entered this date,

IT IS HEREBY ORDERED that Plaintiff Kalamazoo River Study Group's motions for summary judgment as to Defendants Rockwell International and Eaton Corporation (Docket # 's 650 & 662) are DENIED.

IT IS FURTHER ORDERED that Defendant Rockwell International's motion for summary judgment (Docket # 654) is DENIED.

IT IS FURTHER ORDERED that Defendant Eaton Corporation's motion for summary judgment (Docket # 656) is GRANTED IN PART and DENIED IN PART. Eaton's motion for summary judgment is granted with respect to the Marshall and Kalamazoo facilities and is denied with respect to the Battle Creek facility.

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## UNITED STATES DISTRICT COURT FOR THE WESTERN DISTRICT OF MICHIGAN SOUTHERN DIVISION

SEC - 8 Fill2: 18

KALAMAZOO RIVER STUDY GROUP,

Plaintiff,

File No. 1:95-CV-838

HON. ROBERT HOLMES BELL

ROCKWELL INTERNATIONAL, et al.,

Defendants.

## ORDER AND PARTIAL JUDGMENT

In accordance with the opinion entered this date,

IT IS HEREBY ORDERED that JUDGMENT is entered in favor of Defendant Eaton Corporation.

IT IS FURTHER ORDERED that JUDGMENT AS TO LIABILITY ONLY is entered in favor of Plaintiff Kalamazoo River Study Group and against Defendant Rockwell International.

IT IS FURTHER ORDERED that JUDGMENT AS TO LIABILITY is entered in favor of Defendants Eaton and Rockwell and against Plaintiff KRSG on Defendants' counterclaims.

v.

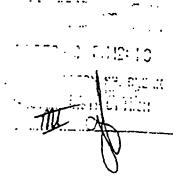
Date: December 7, 1998

ROBERT HOLMES BELL

UNITED STATES DISTRICT JUDGE

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# UNITED STATES DISTRICT COURT FOR THE WESTERN DISTRICT OF MICHIGAN SOUTHERN DIVISION



KALAMAZOO RIVER STUDY GROUP,

Plaintiff,

File No. 1:95-CV-838

V.

HON. ROBERT HOLMES BELL

ROCKWELL INTERNATIONAL, et al.,

Defendants.

## OPINION

This matter was tried to the bench from August 10, 1998 to
August 17, 1998. The Court has considered opening statements of
counsel, written closing arguments of counsel, proposed Findings
and Conclusions from both parties, the testimony of witnesses at
trial, documents and photos admitted as exhibits at trial, and
deposition excerpts designated by the parties. The Court has
considered what inferences can reasonably be drawn from the
direct and circumstantial evidence, and has considered the
demeanor and manner of the witnesses who testified at trial in
assessing the credibility of and weight to be accorded the
testimony of those witnesses. This opinion contains the Court's

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findings of fact and conclusions of law, in accordance with FED.

R. CIV. P. 52(a).

## I. Background Facts

Plaintiff Kalamazoo River Study Group ("KRSG") is an unincorporated association of four paper companies duly existing under and by virtue of the laws of the State of Michigan. Its members are Millennium Holdings, Inc. (formerly HM Holdings, Inc./Allied Paper Inc.), a Delaware corporation ("Allied");

Georgia-Pacific Corporation, a Georgia corporation ("Georgia-Pacific"); Fort James Operating Company, Inc. (formerly James River Paper Company, Inc.), a Virginia corporation ("James River"); and Plainwell Inc. (formerly Simpson-Plainwell Paper Company and Plainwell Paper Company, respectively), a Michigan corporation ("Simpson"). The four members of Plaintiff KRSG have the legal capacity to bring the claims in this lawsuit.

Defendant Eaton Corporation is an Ohio corporation. Eaton is a covered person under CERCLA Section 107(a), 42 U.S.C. § 9607(a), and has the legal capacity to bring its counterclaim in this lawsuit.

Defendant Meritor Automotive (the successor to the Automotive Division of Rockwell International, Inc.) ("Rockwell") is a Delaware corporation. Rockwell is a covered person under

CERCLA § 107(a), 42 U.S.C. § 9607(a), and has the legal capacity to bring its counterclaim in this lawsuit.

In August 1990 a 35-mile length of the Kalamazoo River from the confluence of Portage Creek with the River (in the City of Kalamazoo) downstream to the Allegan City Dam, and a three-mile portion of Portage Creek upstream of its confluence with the Kalamazoo River was added to the National Priorities List ("NPL") by the United States Environmental Protection Agency ("USEPA") pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605. The NPL Site is known as the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site ("NPL Site").

The Michigan Department of Natural Resources (now the Michigan Department of Environmental Quality) ("MDNR" or "MDEQ") and the United States Environmental Protection Agency ("EPA") determined that the NPL Site is contaminated with hazardous substances, including polychlorinated biphenyls ("PCBs"). PCBs are hazardous substances as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14). In 1990, the MDNR and the EPA signed a Cooperative Agreement authorizing the MDNR to conduct an Endangerment/Risk Assessment for the NPL site.

The MDNR identified three paper mills -- Allied, Georgia-Pacific and Simpson -- as the principal sources of PCBs contaminating the NPL Site due to past business operations involving the recycling of paper, including deinking, during the period of 1950-1975.

Following the listing of the Site on the NPL, in December 1990, 3 members of KRSG (Allied, Georgia-Pacific, and Simpson) entered into an Administrative Order by Consent ("AOC") with the Michigan Department of Natural Resources ("MDNR") to fund and conduct a Remedial Investigation/Feasibility Study ("RI/FS") of the NPL Site. James River subsequently joined the KRSG, but did not sign the AOC. James River has nevertheless participated in the conducting and funding of the RI/FS process.

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Under the RI/FS Plaintiff's members are required to extend their investigation upstream and downstream of the NPL site to include a 95 mile stretch of the Kalamazoo River and 4 Operable Units ("OUs") consisting of 5 disposal areas. Accordingly, the Site for purposes of this litigation extends from upstream of the Eaton Battle Creek facility to downstream of the Rockwell facility.

¹The OUs are the Allied Paper Property/Bryant Mill Pond Area, the Willow Boulevard Site and A-Site, the King Highway Landfill and the 12th Street Landfill.

Although Plaintiff's members have neither admitted to liability nor been adjudged legally liable for conditions at the NPL Site, Plaintiff has incurred substantial past costs for its performance of the RI/FS activities at the NPL Site and will incur additional substantial costs in the future in connection with those activities and remediation of the NPL Site.

The AOC does not purport to include all persons that may have caused or contributed to the disposal of PCBs or other hazardous substances at the Site.

Plaintiff KRSG filed this action in December 1995, seeking to recover its response costs from eight corporations. KRSG alleged in its complaint that the defendants contributed to the PCB contamination of the NPL Site and are liable for response costs under CERCLA, 42 U.S.C. § 9601 et seq, the Michigan Natural Resources and Environmental Protection Act ("NREPA"), M.C.L.A. § 324.20101 et seq., and various common law theories.

Two corporations (Hercules and Rock-Tenn) have been dismissed from this action on stipulation. Summary judgment has been entered in favor of 3 corporations (Benteler, Upjohn and Menasha) and in favor of two of the three Eaton plants. With respect to Plaintiff's claims, only the liability of Defendants

Rockwell and Eaton, for its Battle Creek plant, were at issue in this trial.

Defendants have filed counterclaims against Plaintiff and its members, alleging that Plaintiff's members are responsible for the PCB contamination under CERCLA, NREPA and various common law theories. These counterclaims were also tried to the Court.

## II. PCBs

Polychlorinated biphenyls ("PCBs"), are synthetic compounds containing chlorine, hydrogen and carbon. Each molecule contains a varying number of chlorine atoms (between 1 and 10) attached to two aromatic rings.

PCBs were first manufactured in the 1920s. In the United States, PCBs were manufactured almost exclusively by Monsanto Corporation under the trade name "Aroclor" followed by a number designation. The Aroclors pertinent to this case are Aroclors 1242, 1248, 1254, and 1260. The last two digits represent the percentage of chlorine by weight in the mixture. The higher the number, the greater the molecular weight of the Aroclor.

According to Monsanto literature, "the excellent electrical : properties, fire resistance and inertness of the Aroclors make them useful in many applications," including "the electrical insulating field and in such widely differing applications as

nonflammable hydraulic media, high-temperature and high-pressure lubricants, heat-transfer and expansion media, sealing compounds, adhesives and protective coatings, including plastics, pigments, lacquers, paints and varnishes." Exh. 1372 & 2030. PCBs were particularly useful in oils used in high heat operations such as die casting and forging because of their fire retardant qualities.

Aroclor 1242 was used in carbonless copy paper produced by NCR as an ink carrier or solvent during the period 1957-1971.

Monsanto sold over 44 million pounds of Aroclor 1242 for this purpose. Essentially all of the Aroclor 1242 used in carbonless paper has been released to the environment. The recycling of NCR carbonless copy paper constitutes the major source of PCBs into the paper industry. Exh. 8017, p. 27. Other PCBs, primarily Aroclor 1254, were used to a limited extent in flexographic printing inks. The total usage in this application is estimated at 50,000 pounds, primarily in the 1968-71 time frame. Exh.

Although Aroclor 1242 is the Aroclor predominantly associated with waste paper recycling operations, according to the EPA's 1977 report on PCB involvement in the pulp and paper industry, paper mills also utilized PCB Aroclors other than

Aroclor 1242 in transformers and capacitors, hydraulic or heat transfer systems, lubricants and paints. Exh. 8017, p. 27.

Aroclor 1254 has been found in many recycled papers, including bond paper, newsprints and paperboard produced by the paper industry and in the paper industry by-products.

It was not until the early 1970s that scientists and governmental regulators became aware of the environmental and public health concerns associated with PCBs. In 1971 Monsanto ceased selling PCBs for use in all but closed electrical systems such as capacitors and transformers. Although PCBs stopped being manufactured, they still appeared in waste streams due to the recycling of oils and paper products, and due to their presence in the soil, water, air, and landfills.<sup>2</sup>

PCBs have an affinity for organic particles. They tend to attach to fine-grain particles and to accumulate in organically rich areas. In rivers, PCBs attach to muck and slime. Because of their affinity for fine sediments, PCBs typically will be found in greatest concentration in sediments in depositional zones (quiescent areas of the river where sediments accumulate) near the source. Farther downstream from the source one can

<sup>&</sup>lt;sup>2</sup>As late as the 1980s Rockwell was on the alert for PCBs in cutting oils, hydraulic oils and tooling wax. Exh. 5019 & 5020.

expect a decline in the concentrations of PCBs from a given source due to dilution, settling into the sediment, and volatilizing into the atmosphere.

Based upon studies conducted between 1972 and 1989, the MDNR estimated in 1990 that there were about 220,000 pounds of PCBs in the sediments in and adjacent to Portage Creek and the Kalamazoo River. In a March 1997 briefing Report the MDEQ estimated that river sediments contain "well over 350,000 pounds of PCBs and the paper companies' five unconfined disposal areas situated on the river banks contain millions of cubic yards of PCB-contaminated waste."

The ratio of Aroclor 1242 to 1254 in river sediments is approximately 4:1 throughout the Site. The PCBs in fish generally reflect the PCBs in sediments where they feed. Fish samples taken from Bryant Mill Pond, where PCBs would be expected to be primarily from paper mill sources, show a significant presence of Aroclor 1242. Fish samples taken from Morrow Lake, upstream of the paper mills, and near Trowbridge Dam, downstream of the mills, show a higher percentage of Aroclor 1254 than Aroclor 1242. Fish bioaccumulate higher molecular weight Aroclor mixtures at much higher levels than lower molecular weight

Aroclor mixtures. The fish advisory in effect for the Kalamazoo River from Battle Creek downstream to Morrow Lake is for carp only. The fish advisory downstream of Morrow Lake concerns not only bottom dwelling carp, but almost every species of game fish as well, indicating a higher level of PCBs downstream of Morrow Lake.

## III. KRSG's Members

Although Plaintiff's members stated in the AOC that their execution of the AOC was the product of settlement negotiations, and did not constitute an admission of liability, in this action Plaintiff's members have not contested their liability as PRPs.

PCB use and release of PCBs to landfills and to the River by the Plaintiff paper companies is well documented in the 8000 series of the Exhibits introduced at trial.

Each of KRSG's members operate or operated paper mills adjacent to Portage Creek or the Kalamazoo River. Each of KRSG's members, for varying periods of time, used recycled office paper as a source of pulp in their papermaking operations. The recycled office paper contained some amounts of carbonless copy

<sup>&</sup>lt;sup>3</sup>If there were equal amounts of Aroclor 1254 and 1242, fish would bioaccumulate 3 to 4 times more Aroclor 1254 than Aroclor 1242.

paper which was manufactured with PCB Aroclor 1242. Plaintiff's expert, Dr. Brown, conceded that most of the Aroclor 1242 found adjacent to or downstream of the Plaintiff's companies came from the recycling or deinking of carbonless copy paper. The paper companies have a long history of releasing PCBs to the Site, either directly through their effluent or indirectly through sludge disposal practices in landfills adjacent to Portage Creek or the Kalamazoo River. The EPA has concluded that the Bryant Mill Pond Area is the most important upstream source of PCBcontamination at the Site. Exh. 8813. Allied, James River, Georgia-Pacific and Simpson have each contributed PCBs to the NPL Site in large quantities as a result of their deinking and paper recycling operations. PCBs released from the Plaintiff's members' facilities have come to be located in the sediments of Portage Creek and the Kalamazoo River.

The PCBs in the wastewater streams of paper mills are generally more similar to Aroclor 1242 than to the other Aroclors or to PCBs found in the general environment. However, Aroclor 1254 has also been found in the paper residuals from Plaintiff's members in some cases at high levels. The Technical Memoranda submitted by Plaintiff to the MDNR reveal that each of the landfills associated with Plaintiff's members contain multiple

detections of Aroclors 1254 and 1260 in addition to Aroclor 1242. At the Allied Paper Operable Unit there were over 30 detections of Aroclor 1254. Exh. 8719, Table 3-10. There were also multiple detections of Aroclor 1254 at the Willow Eoulevard/A-Site Landfill, the King Highway Landfill and the 12th Street Landfill Operable Units. Exh. 8738, Table 3-11, Exh. 8725, Table 3-9, Exh. 8615, Table 3-8. Accordingly, the presence of Aroclor 1254 in the river cannot necessarily be attributed to sources other than the paper mills.

PCBs continue to migrate from the Plaintiff's members'
plants and landfills into the environment due to the effects of
erosion along the river banks, the surface runoff from the
disposal areas, and groundwater flow.

The contributions of PCBs to the NPL Site by Allied, James River, Georgia-Pacific and Simpson, individually and together, are in nature, quantity and durability sufficient to require imposing the costs of response activities for the NPL Site upon each of those four parties.

Allied, James River, Georgia-Pacific and Simpson are each liable and responsible parties under Section 107 of CERCLA, 42 U.S.C. § 9607, for the PCB contamination of the NPL Site.

## IV. Defendants' Liability

KRSG's members do not dispute their responsibility for the bulk of the Aroclor 1242 found at the Site. Their theory of liability against Defendants Eaton and Rockwell is directed primarily at contributions of Aroclor 1254.

As this Court has previously held, because KRSG's members are liable parties under Section 107 of CERCLA, Plaintiff KRSG's claims against the remaining defendants are restricted to a claim for contribution under CERCLA Section 113(f)' and its counterpart under Michigan's NREPA. (Opinion, KRSG v. Rockwell, et al., Case No. 1:95-CV-838, Jan. 16, 1998). See also Centerior Service Co. v. Acme Scrap Iron & Metal Corp., 153 F.3d 344, 356 (6th Cir. 1998)("[P]arties who themselves are PRPs, potentially liable under CERCLA and compelled to initiate a hazardous waste site cleanup, may not bring an action for joint and several cost recovery, but are limited to actions for contribution governed by the mechanisms set forth in CERCLA § 113(f).").

<sup>&</sup>quot;In actions seeking contribution, unlike those for joint and several cost recovery, the burden is placed on the plaintiff to establish the defendant's equitable share of response costs. Liability is not joint and several, but merely several."

Centerior Serv. Co. v. Acme Scrap Iron & Metal Corp, 153 F.3d 344, 348 (6th Cir. 1998) (citations omitted).

It is not unusual in a case involving historical use of chemicals for a plaintiff to be unable to produce direct evidence of the release of hazardous substances by a particular defendant. Because of the passage of time, documentary evidence of products used in the industry may no longer exist. PCB use poses a particularly difficult case because PCBs were not known to pose an environmental hazard until some 30 or more years after they began to be used in various industries. Accordingly, the presence of PCBs was not necessarily documented on the products, and users may not have been aware when they were using products containing PCBs. Until the 1970's there was no requirement that industries monitor their effluent for the presence of PCBs.

Plaintiff's case against Rockwell and Eaton stretches back more than 50 years. During a substantial portion of this time, companies did not monitor their use of PCB-containing products and did not test their discharges for PCBs. Thus it is not surprising that there is a lack of direct evidence regarding the use of PCBs at any of the industrial plants along the Kalamazoo River. Direct evidence, however, is not necessary. Plaintiff may prove its case by circumstantial evidence. See e.g., Reichhold Chemicals v. Textron, 888 F. Supp. 1116, 1128 (N.D.

Fla. 1995) (consideration of circumstantial evidence regarding disposal of hazardous substances from 1939-54).

As this court has previously held in its opinion dated

March 6, 1998, Docket # 689, the standard that will be applied

for testing the liability of the defendants in this action is the

"threshold of significance" standard: is the evidence of

defendant's release of PCBs of sufficient significance to justify

holding defendant liable for response costs?

#### V. Eaton

Prior to its demolition in 1983-84, the Eaton Battle Creek facility was located at 463 North 20th Street, Battle Creek, Michigan. The plant was approximately one-half mile from the Kalamazoo River.

At this facility Eaton manufactured parts for the automotive industry, including internal combustion engine valves and gears.

Manufacturing processes at the Battle Creek facility used oils such as straight and water soluble cutting oils, hydraulic oils, and quench oils.

The evidence regarding Eaton's treatment of process oils prior to the late 1960s was far from clear. It appears that oil collected in pans under the machines did not drain into anything.

Oils were sumped out of these pans and taken to the mud room

where waste metals and sludges were separated. Some of the drip pans under the conveyor belts, where process oils would regularly drip off, however, were piped directly into the sewer lines.

(Galen p. 92-93). Process wastewaters from machining operations were disposed of into the closest available sewer line.

Residual oils on parts regularly dripped onto the floors.

There were no floor drains at the plant. Because of the wood

floors which would swell and buckle if wet, Eaton took great care

to keep water off the floor. (Galen dep. p. 22). Significant

quantities of dry absorbent such as "Floor Dry" or "Speedy-Dry"

were maintained to keep the wood block floors dry.

In 1967 the Michigan Water Resources Commission conducted a waste water survey of the Eaton Battle Creek Plant and determined that the plant was discharging 2220 pounds of oil a day to the Kalamazoo River via the storm sewers.

In the late 1960s Plant Engineer Clifford Galen focused his attention on the problem of oils in Eaton's effluent. The effluent was being discharged into two sewers, the storm sewer and the sanitary sewer, both of which discharged directly to the Kalamazoo River. The storm sewer was a concrete pipe that ran under Eaton's property, and then became an open ditch between Eaton's property and the River. (Galen dep p. 16). The ditch

had dark stains from oils. In the late 1960s the sanitary sewer was connected to the waste water treatment Plant. By December 1969 the amount of oil discharged in the Eaton plant effluent was reduced to 177 pounds a day. Exh. 2018.

There is no question that over the years, particularly before 1970, Eaton discharged large quantities of oil to the Kalamazoo River, and that the discharge of those oils was of concern to the DNR. The discharge of oils to the River, however, does not answer the key question of whether those oils contained PCBs. There is no evidence that Eaton ever purchased any oils containing PCBs. Former employees at Eaton's Battle Creek facility recalled a number of oils that had been purchased by the plant over the years, but none of the employees recalled any purchases of oils containing PCBs. Plaintiff's attempt to show that Eaton purchased Pydraul, a hydraulic oil containing PCBs, from Monsanto was excluded from the evidence.

Yet, PCBs have been found on the Eaton Battle Creek

property. When the Eaton Battle Creek facility was demolished in

1983-1984, the MDNR requested Eaton to test the wood block floors

for PCBs. Eaton hired Howard Laboratories to do the testing.

Howard tested 55 of the approximately 2.8 million wood blocks on

the floor: 27 samples from under capacitors in Building C, 11

samples for background in Building C, 6 samples for background in Building A, 7 samples from the heat treat area in Building B, and 4 additional blocks. All 55 samples tested showed the presence of PCBs in the range of 3.1 mg/kg(ppm) (3100 ppb) to 155 mg/kg(ppm) (155,000 ppb). The dominant Aroclors were 1248 and 1254.

Aroclor 1248 was found in 6 out of 6 samples in Building A, in 9 out of 11 samples in Building C (background), in 24 out of 27 samples in Building C (under capacitors) and in 7 out of 7 samples in Building B. Aroclor 1254 was found in 6 out of 6 samples in Building A, in 9 out of 11 samples in Building C (background), in 23 out of 27 samples in Building C (under capacitors) and in 3 out of 7 samples in Building B. Aroclor 1242 was found in only 4 samples and Aroclor 1260 was found in only 3 samples. Exh. 2067.

Aroclor 1254 was expected to be found in conjunction with the capacitors. Exh. 2065. However, in light of the wide distribution of Aroclor 1248 in the wood block flooring, the PCBs cannot all be explained by leaking capacitors and transformers. Monsanto literature does not indicate that Aroclor 1248 was ever used in capacitors and transformers. Exh. 2023 & 2030. Because Aroclor 1248 was not known to be used in di-electric equipment

such as capacitors and transformers, its presence in the flooring is circumstantial evidence that PCBs were used in some of the other oils at Eaton.

Despite the evidence that Eaton used some PCB-containing oil, that evidence does not necessarily mean that those oils were discharged into the River. Whether those PCBs were discharged into the River depends on which oils those PCBs were used in.

Kenneth Manchen, an environmental engineer at Eaton, testified that because he did not observe any definable pattern to the PCBs in the wood flooring, he concluded that in all probability the PCBs must have come from hydraulic fluids used during the war years. Both Aroclor 1248 and Aroclor 1254 have been associated with hydraulic oils.

If the PCBs used by Eaton were simply in the di-electric and hydraulic fluids, there is insufficient evidence that those PCBs also made their way to the River % mile away. Transformers and capacitors are closed systems. Although there is evidence that they leaked on occasion, it was not a regular occurrence, and the leaks would be soaked up by the floor or swept up with floor dry. Hydraulic operations are nominally closed operations. Although hydraulic fluid would leak and would have to be replenished, the testimony of Eaton employees indicates that the hydraulic

machines leaked into drip pans that were not connected to the sewers. Hydraulic oil spilled when machines were cleaned and one employee recalled an instance where a hydraulic line completely ruptured. There is no evidence, however, that hydraulic oils were routinely flushed from the hydraulic equipment into the drains. The testimony is that hydraulic oils that spilled onto the floor were either absorbed into the wood block floors or were absorbed with a dry absorbent, swept up and discarded with the non-liquid wastes rather than with the wastewater. The floors were cleaned periodically with a scarifying machine that scraped up the oil residue on the floors.

In 1981, VERSAR, an outside environmental contractor to

USEPA, inspected the Battle Creek plant to document Eaton's

compliance with PCB marking and disposal regulations. VERSAR

found several slight leaks from transformers, but no leaks in the

in-service capacitors. VERSAR sampled the cutting, quench and

hydraulic oils from various tanks and machines in the plant and

found no detectable levels of PCBs in those oils. Exh. 2059.

VERSAR did detect Aroclor 1242 at a concentration of level of 7

ppm in the grinding swarf (sludge). Grinding swarf is the sludge

created by the process of grinding metal parts. It usually

consists of small particles of the metal part being ground, the

grinding wheel or tool, and the cooling fluid used in grinding. Because VERSAR did not find PCBs in the process oils, Eaton personnel, after investigating, concluded that the PCBs in the grinding swarf were most likely attributable to floor scrapings from the floor scarifier being mixed with the grinding swarf. (Heindrichs dep. § 277-79).

In order to show that Eaton released PCBs to the Site in any measurable quantity, Plaintiff would have to show that the PCBs were found in the oils used in the open systems, such as the quenching, or cutting operations. Plaintiff suggests that because Aroclor 1254 has been associated with cutting oils and quench oils in the literature and in some heavy industries, it likely was used in this manner at Eaton. The wastewater problem at the Eaton plant, however, was described in an Eaton memorandum of May 10, 1968, as being primarily concerned with the discharge of soluble oil in solution into the storm sewer and then into the Kalamazoo River. Exh. 2013. The majority of the coolants used by Eaton at the Battle Creek facility were water soluble coolants. Soluble oils did not usually contain PCBs because PC do not readily mix with water. Monsanto literature states that "[a]ll Aroclors are insoluble in water." Exh. 1372, p. 9. Court is aware of only one reference in Monsanto literature to

the use of Aroclors in water soluble oils. This document notes the commercial use of Aroclors in high quality cutting oils of the "soluble oil" type. Exh. 1372, p. 17. This passing reference to Aroclors in water soluble oils appears to be an atypical use of PCBs. Moreover, because higher weight Aroclors are more hydrophobic (less soluble) than lower weight Aroclors, there is little likelihood that Aroclor 1254 would be found in soluble oils.

Plaintiff has offered no evidence of PCBs in Eaton's effluent except a couple inconclusive studies by the Michigan Water Resources Commission ("MWRC"). In February 1972, the MWRC conducted a study of industrial effluents into various rivers of the state. The sample taken from the joint outfall from Eaton's Battle Creek facility and Clark Equipment Company showed 1.4 ppb of PCBs based on an Aroclor 1254 standard. Because the sample was taken from a joint outfall, it is impossible to attribute the PCB detection to Eaton as opposed to Clark Equipment Company.

In September 1972 the MDNR tested the storm sewer as it less Eaton's property and found .24 ppb and .12 ppb of PCBs. Exh.

2028. Because the storm sewer lines did not originate at Eaton and served areas outside of the plant, these test results were

also inconclusive regarding the presence of PCBs in Eaton's effluent. This test is also somewhat suspect because the results were at the limit of detectability.

In 1980 the MDNR conducted a survey which monitored Eaton's wastewater discharge for a 24 hour period. The results showed no traces of PCB. The detection limit used was .1 ppb. Exh. 6011.

As a result of this test, the MDNR stopped testing Eaton's effluent for PCBs as a requirement for the NPDES permit. The MDNR determined that while occasional PCB's may be in the oils used in the plant, they only appeared at trace contaminant levels. Exh. 6012.

Based upon the evidence from the plant itself, it appears to this Court that very little, if any, of the PCBs from the Eaton plant found their way into the sewer system and on to the Kalamazoo River. The evidence from the Kalamazoo River supports this conclusion. Given the evidence that Eaton was discharging large quantities of cutting and quench oils into the sewer lines which were discharged into the river, if those oils contained PCBs, those PCBs should be present in the ditch and the river. Plaintiff, however, has offered no substantial evidence that Eaton was responsible for discharging PCBs to the Kalamazoo River.

The discharge point from the Eaton plant into the Kalamazoo River was approximately 15 miles upstream from the most upstream boundary of the NPL Site, but still within the Site that Plaintiff is required by the AOC to study. The experts are in agreement, that PCBs in the water tend to settle out with the sediment in depositional areas. There are numerous depositional zones in the 15 miles between Eaton's Battle Creek facility and Morrow Lake. If PCBs had been released from Eaton they would have shown up in these depositional zones.

KRSG has made no study of the storm sewer ditch to locate

PCBs. KRSG has not sampled either sediments or settleable solids

immediately adjacent to the discharge point from the Eaton sewer

to the Kalamazoo River. In fact, KRSG has not taken any sediment

samples in the entire 15 mile stretch of the River downstream of

Eaton's Battle Creek plant. Instead, for that portion of the

Kalamazoo River from Battle Creek to the Morrow Dam, Plaintiff

relies on a 1971 MDNR study, the 1976 Wuycheck study, and a 1988

MDNR study.

In July 1971, a Kalamazoo River water sample downstream of the Battle Creek facility near Augusta, Michigan, indicated a total PCB concentration of 0.1 ppb. There is insufficient evidence to attribute this finding to Eaton's Battle Creek plant.

Approximately 25 percent of the Kalamazoo River watershed is upstream of Battle Creek. The sample could have reflected effluent from the Battle Creek Wastewater Treatment Plant which was located approximately one mile downstream from Eaton's Battle Creek plant. Moreover, Plaintiff has not attempted to rule out other industries upstream as potential sources of the PCBs.

For purposes of this Court's determination of Eaton's contribution to PCBs in the River, the Wuycheck data is perhaps the most relevant. The Wuycheck study was undertaken in the mid-1970s, close in time to when PCBs were being used in industry. If PCBs had been released by Eaton as alleged by Plaintiff, they should have been detected in the Wuycheck tests.

In 1976, John Wuycheck, an employee in the Biology Section
of the MDNR, conducted an "intensive" survey of the Kalamazoo
River. Exh. 2036. Wuycheck tested both sediment and settleable
solids (also known as suspended solids) in the Kalamazoo River.
Of the 6 locations tested between the Battle Creek plant and
Morrow Lake, the only positive sediment samples came from 35th
Street in Galesburg (Aroclor 1254 at 1190 ppb) and Morrow Lake at
Rosemont St. (Aroclor 1254 at 3140 ppb). These sites are
approximately 13 and 15 miles downstream of Eaton's Battle Creek
facility. The test from the site closest to Eaton's plant,

Stringham Road, was non-detect for PCBs. If Eaton had discharged PCBs in measurable quantities, those PCBs would have been detected in the 1976 sampling done at the Stringham Road sampling location. No PCBs were detected at Stringham Road in either sediments or settleable solids.

The Wuycheck study detected PCBs in suspended solids at Custer Road, approximately 5% miles downstream of the Battle Creek facility (1140 ppb) and at 38th Street in Galesburg, approximately 11 miles downstream of the Battle Creek facility (810 ppb). The settleable solids test is useful for determining the presence of PCBs in the water column, but not for determining the source, quantity or concentration of PCBs. In a settleable solids test the collection bottles are suspended in the water for approximately 4 weeks. During that time period particles from the water and organic film accumulates in the bottle and collects PCBs from the water column. Because the organic materials in the bottle tend to attract PCBs, the test may indicate an artificially high reading of PCBs. The detection of PCBs in the water column over 5 miles downstream of the Eaton Battle Creek facility also tells little to nothing about the Eaton Battle Creek facility. Since almost 25 percent of the watershed for the Kalamazoo River is upstream of Battle Creek, PCBs in the water

column could be from unknown point sources, runoff, and air pollution. The Custer Road collection point was also within the plume of the Battle Creek Wastewater Plant.

In 1988 the MDNR tested the sediment at 11 locations between Battle Creek and Morrow Lake. Only one of the 11 sediment samples tested positive for PCBs. PCBs at a concentration level of 1000 ppb of Aroclor 1254 were detected at one location downstream of the Battle Creek facility and upstream of the discharge point of the Battle Creek Wastewater Treatment Plant. (Exh. 6020). The sediment tests from the remaining 10 locations were non-detect for PCBs.

Plaintiff KRSG contends that the lack of positive tests for

PCBs in the 1988 study is deceptive and should not be relied upon

to show the absence of PCBs in the River because the MDNR used a
high detection limit of one part per million (1000 ppb).

Plaintiff's argument ignores the burden of proof. This Court

will not guess what the use of lower detection limits might have
shown. Plaintiff bears the burden of proof on the issue of
Eaton's contribution to the PCBs in the River. If Plaintiff was
dissatisfied with the available studies, Plaintiff could have

done its own studies of this portion of the River.

If, as the evidence shows, Eaton was discharging a ton of oil per day in the 1960s, then, if those oils contained PCBs, one would expect them to show up in the River sediments near or immediately downstream of the plant. The evidence does not support Plaintiff's suggestion that Aroclors 1248 and 1254 were used by Eaton in its quench and cutting oils. If they had been, they would have shown up in the River. It appears that the PCBs used in Eaton's Battle Creek facility were only found in the transformers and capacitors and the hydraulic fluids, and those fluids were not released to the River in any regular or measurable manner.

The Court is struck by the lack of evidence regarding PCBs at or near the outfall of the drain from Eaton to the River. As the party with the burden of proof in this matter, the Court would have expected KRSG to have presented some evidence of River contamination close to Eaton's Battle Creek plant. The Court is also struck by the complete lack of evidence of Aroclor 1248 in the River upstream of Morrow Lake. Since Aroclors 1254 and 1248 were both in the floor of Eaton's plant, then if the Aroclor 1254 from the floor reached the River, presumably the Aroclor 1248 would have reached the River as well. Yet Plaintiff has come

forward with no evidence of Aroclor 1248 in the River downstream of Eaton and upstream of Plaintiff's members.

Plaintiff's expert, Dr. Mark Brown, acknowledged that Morrow Lake is a large depositional area. The highest level of PCBs in Morrow Lake, however, is 3.1 ppm. This figure is quite striking when contrasted to the high level of PCBs detected below Morrow Lake. In the vicinity of Plaintiff's members downstream of Morrow Lake and above the confluence with Portage Creek there are PCB concentrations of 9.9 ppm, 0.7 ppm, 7 ppm, 44 ppm, 42 ppm, 15 ppm, 106 ppm, and 86 ppm. Exh. 8929.

The Court cannot accept Eaton's suggestion that the PCBs, while not found in the River near the Battle Creek plant, somehow ended up in the NPL Site downstream of Morrow Dam. Under Plaintiff's theory, the PCBs from Eaton would have traveled on the surface of the River without leaving a trace, and then accumulated in the sediment just downstream of Morrow Lake. This theory is not consistent with any of the experts' testimony regarding river transport of PCBs and sediments. The experts were in agreement that the PCBs would be found in greatest concentration in depositional areas closest to the source.

Plaintiff would like the Court to infer that the sediments might have been disturbed or blown out by floods or the removal

of dams on the River. This theory finds no support in the evidence. Defendants' expert, Dr. Connolly, sampled the sediment in Morrow Lake for a form of Cesium, an element deposited by the atmospheric testing of nuclear weapons beginning in 1954. The Cesium analysis revealed that Morrow Lake sediments have remained virtually undisturbed since before 1954. The sediments in Morrow Lake are accordingly a reliable source of information on PCBs that were historically released to the River.

Based upon the evidence presented at trial, this Court concludes that there were PCBs in Eaton's di-electrical equipment (capacitors and transformers) and in some of Eaton's hydraulic oils. The PCBs in the di-electrical equipment were in closed systems. Although those systems did occasionally leak, the Court concludes that the leaks were absorbed by the wood floors or cleaned up with oil dry. The hydraulic systems were semi-closed systems. Although there would be more leakage from the hydraulic systems than from the di-electrical systems, those leaks would also have been primarily absorbed by the wood block flooring or swept up with oil dry. The Court does not find that either of these systems resulted in the loss of oils through the sewer systems and into the River. The oils that reached the River from Eaton appear to have been oils that did not contain PCBs.

Because the concentrations of PCBs upstream of Plaintiff's members are low, their incidence is sporadic, and they have not been located close to the Eaton facility, the Court concludes that Plaintiff KRSG has not met its burden of demonstrating that any PCBs released from Eaton's Battle Creek facility have added to the PCB contamination of the Kalamazoo River. There is insufficient evidence of a detectable or measurable discharge of PCBs from Eaton's Battle Creek plant into the Kalamazoo River to hold Eaton liable under CERCLA, NREPA, or any of the common law theories. Plaintiff alleges. Judgment will be entered in favor of Eaton.

### VI. Rockwell

and its predecessors operated a manufacturing plant on a 30.4 acre property at 1 Glass Street, Allegan. The plant was located on the Kalamazoo River, downstream of the Allegan City Dam. The property is bounded immediately on the north side by the Kalamazoo River, and is located on a portion of the Kalamazoo River that KRSG has agreed to study pursuant to the AOC.

Since at least 1953 Rockwell manufactured universal joints and driveline parts for heavy trucks and construction equipment

at its Allegan facility. Operations included machining, part hardening through heat treating and assembly.

Prior to 1960 Rockwell discharged its industrial wastewater directly into the Kalamazoo River. The wastewater contained sludge, heavy metals, process wastes, and oil. Exh. 1004. Rockwell's wastes included machine coolants, oily wastewaters, and spent cutting oils. There are no records indicating that the Rockwell plant purchased quench oils, cutting oils or hydraulic oils containing PCBs. There is also no evidence that Rockwell conducted forging, die casting or other extremely high temperature operations that might have benefitted from the fireresistant qualities of PCB-containing oil. From the early 1960s onward, Rockwell began making increasing use of water-based process oils, i.e. water-soluble oils. Since PCBs do not readily mix with water, they are an unlikely additive to water soluble oils. In 1978 Rockwell advised its oil waste hauler that information obtained from OSHA Material Safety Data sheets and its suppliers indicated that Rockwell's waste oil did not contain any PCBs. Exh. 8931. The wastewater effluent from Rockwell's treatment ponds was tested by the MDNR in 1976 and 1986. Those tests found no PCBs in Rockwell's outfall to the Kalamazoo River. Exh. 5012, 5014, 5025 & 5027.

Notwithstanding the lack of direct evidence of PCB use by Rockwell, there is ample circumstantial evidence that there were PCBs in its process oils.

In 1987, the EPA added the Rockwell site to the National Priorities List ("NPL"), making the Rockwell site a national priority for study and clean-up based upon the presence of contaminants other than PCBs. Those contaminants included lead, arsenic, cyanide, chromium and solvents. Exh. 1004. In 1988 Rockwell and the EPA signed an Administrative Order by Consent, by which Rockwell agreed to conduct a remedial investigation and feasibility study ("RI/FS") at the site. Id.

To fulfill its obligations under the AOC, Rockwell hired environmental consultants, including Environmental Strategies

Corporation ("ESC"), to perform testing of the soil and groundwater at the Rockwell site. Those tests revealed the presence of PCBs in the soil, groundwater, and the light non-aqueous phase liquid ("LNAPL") that lies beneath the surface at the Rockwell Site.

Due to the presence of PCBs in all the oil handling areas at Rockwell, this Court concludes that Rockwell used PCB-containing oils in its industrial processes. Because PCB-containing oils were used, the Court must consider how the oils were handled at

Rockwell and whether the PCB-containing oils were released to the River.

Prior to 1945 Rockwell disposed of its waste effluents
through drains leading directly to the Kalamazoo River. From
1945 until the mid-1960s, Rockwell operated a very crude oil
separation system in the Oil Floatation House. The Oil
Floatation House was an above ground waste oil storage tank and
containment house designed to remove insoluble oil from the
plant. Exh. 1006. The Oil Floatation House had a weir that
would separate some of the oils. When the oil had accumulated to
a large quantity, outside agencies would pump the oil off for
road oiling and other uses. The effluent from the Oil Floatation
House emptied through a pipe directly into the Kalamazoo River.
Although some oils were caught in the weir, the weir was not very
efficient at removing oils. The effluent discharged to the river
contained oils. Overflows were not uncommon.

The release of substantial quantities of oils from the Oil

Floatation House into the River caught the attention of the MDNR.

Between 1965 and 1968, the MDNR contacted Rockwell on numerous

occasions complaining about the oil discharges to the Kalamazoo

River. Exh. 1064-68.

Because of the oil discharges from the Oil Floatation House to the Kalamazoo River, the MDNR forced Rockwell to consider an alternative oil handling system. In the early 1960s the plant began using water-soluble oils and coolants. Exh. 1006. mid-1960s Rockwell constructed the Soluble Oil Separation Pond ("SOS Pond"), an unlined pond on the bank of the Kalamazoo River, for its oils and oily waste waters. As oil collected on the surface of the pond it would be burned off, creating large amounts of black smoke. The practice was discontinued in 1965 due to complaints from the Allegan County Health Department. Exh. 1004. By 1965 the pond was already leaking oil into the Kalamazoo River. The MWRC noted after a March 9-11, 1965 survey that the pond was located only about fifteen feet from the Kalamazoo River, and that "[w]hile there is no outlet from the pond, there was a certain amount of oil reaching the river from the area. It is the opinion of the writer that the ground has become saturated with oil and oil is now leaching into the Kalamazoo River." Exh. 1064.

The MWRC noted in November 20, 1968, that although it had solicited a program to improve the oil removal facilities three years earlier, Rockwell had not yet done anything to address the problem. Exh. 1068. In March 1969 the Water Resources

Commission noted that on February 27, 1969, its representative discovered that substantial amounts of oil were being lost to the River, the most significant loss from Rockwell that the MWRC had observed thus far. Exh. 1069.

Finally, in July 1970 the Rockwell plant engineer prepared a preliminary report noting the failure of the SOS Pond and recommending a more comprehensive waste disposal system:

It was assumed that ponds constructed of dirt dikes would be satisfactory for containment and disposal of our water soluble wastes. This method of disposal has been proven to be unsatisfactory due to saturation of the dike walls and sub-soil seepage.

Exh. 1278.

In the early 1970s Rockwell created three new ponds, Pond

Nos. 1, 2 and 3, to use in connection with a new wastewater

treatment building. The SOS Pond, with the sludge still in it,

was filled in and built over. Exh. 1004. Pond Nos. 1, 2 and 3

were used for waste disposal from the early 1970s until the plant

closed. The banks of these ponds also became saturated with oil,

and oil from these ponds also began leaking into the Kalamazoo

River. William Sebright, Rockwell's Environmental Control

Technician, advised the MDNR in 1976 that there had been a

seepage problem in the bank between Pond #1 and the Kalamazoo

River since at least February 1974 when he became involved with

waste control at Rockwell. Exh. 1039. There was enough seepage to cause a slight oil sheen on the River surface. In an effort to halt the seepage Rockwell installed a clay barrier between the pond and the River. Although it was effective for a while, a year later the oil sheen reappeared. Exh. 1039. Oil booms were installed on the ponds, and then in the River itself to try to trap some of the oil floating on the surface of the ponds and the River.

Oil sheens were commonly observed on the Kalamazoo River adjacent to Rockwell's facility from the 1960s on. Based upon the testimony of Mary Schafer and Martha Fleming that they saw oil seeps from the area of the former SOS Pond, the Court finds that the former SOS Pond continued to seep into the River as recently as 1996. To this date, walking on the riverbank or poking a stick into the riverbank is sufficient to release an oily sheen onto the River. The banks are clearly saturated with oil and continue to release these oils into the River.

The Court finds that the discharges of oil were neither minor nor insignificant. They were of sufficient significance that the MWRC demanded first that the Oil Floatation House be replaced, and later that the SOS Pond be replaced with more effective water treatment systems.

PCBs were found in every area on the Rockwell Site where oils were historically handled. Not every sediment or soil sample taken from the oil handling areas contained PCBs. Not every LNAPL sample contained PCBs. Nevertheless, the presence of PCBs shows more than sporadic use.

PCBs were found in the vicinity of the former Oil Floatation
House. Groundwater samples taken in 1990 from the vicinity of
the former Oil Floatation House had Aroclor 1254 in
concentrations of 1.4 ppb and 1.2 ppb. Exh 1257. In 1996
Aroclor 1254 was detected in the groundwater at an average
concentration of 0.3 ppb. Exh. 1114 & 5040. In 1996 Aroclor
1254 was detected in the LNAPL at an average estimated
concentration of 3.3 ppm. Exh. 1012, 1114 & 5040.

PCB Aroclor 1254 was also found at the outfall from the Oil
Floatation House to the River. Despite the fact that 30 years
had elapsed since the Oil Floatation House was last used, the
river sediment still contained PCBs at a level of 35 ppm (35,000
ppb). Rockwell's own expert, Mr. Barrick acknowledged that this
sample had the same chromatogram, or fingerprint, as those PCBs
found at the Rockwell site. Based upon the location from which
this sample was taken and its Aroclor fingerprint, Mr. Barrick
concluded that the PCBs detected in this sample came from the

outfall from Rockwell's Oil Floatation House and could not be attributed to PCBs in the River itself.

Rockwell's sampling in the area of the former SOS Pond in the 1990s found PCB Aroclor 1254 in the oil/LNAPL as well as in the groundwater and soil. Soil samples from the vicinity of the former SOS Pond contained Aroclor 1254 at concentrations of 1.6 ppm, .62 ppm, and 0.34 ppm. Exh. 1179. Surface soil samples from the edge of the Kalamazoo River next to the SOS Pond showed Aroclor 1260 at an estimated level of 900 ppb and 55 ppb.

Groundwater samples collected in 1990 from the vicinity of the SOS Pond had Aroclor 1254 at concentrations of 3.5 ppb and 1.7 ppb. Exh. 1257. Groundwater samples collected in this area in 1993 and 1996 had Aroclor 1254 in concentrations of 3.4 ppb and 0.9 ppb. Exh. 1012. An LNAPL sample from the vicinity of the former SOS Pond had Aroclor 1254 at a concentration of 7.1 ppm. Exh. 1012 & 1114.

Aroclor 1254 was found in each of the three ponds at the surface and also at depth within the sediment. Aroclor 1254 was detected in one of six surface grab samples from Pond 1 at a concentration of 0.33 ppm, in 4 of 6 grab samples from Pond 3 at an average of 0.41 ppm, and from Pond 2 at an average concentration ranging from 0.58-24 ppm. In Pond 3, 5 of 6

ppm. Exh. 1114. The sludge and sediment samples confirm that PCBs were present in the waste oils that were handled in Ponds 1, 2 and 3. No other credible explanation of their source was presented.

Not all of the oil that seeped into the River from the Rockwell plant contained PCBs. In fact, the bulk of Rockwell's oil releases probably did not involve the release of PCBs. Had PCBs been present in the majority of Rockwell's oils, they would have been present in greater concentrations and in more of the samples collected.

Rockwell's release of PCBs also probably decreased in the 1960s as Rockwell began using more water soluble oils and as Rockwell improved its oil waste handling techniques. The amount of PCBs used would have decreased further in the 1970s after PCBs stopped being sold for use in open systems.

During the course of the trial the question was raised as to whether PCBs in the groundwater and LNAPL had migrated or were migrating to the River. Mr. Barrick testified that the PCBs would not tend to migrate because of their adherence to organic compounds in the soil. Based upon the evidence presented, the Court is convinced that at least some of the PCBs in the

groundwater and LNAPL would be removed by the soil before reaching the River. Exh. 5042.

The dominant PCB found on the Rockwell property is 1254.

Aroclor 1242 is the dominant PCB mixture detected both upstream and downstream of the Rockwell plant. Mr. Barrick testified that the gas chromatograph or fingerprint of PCB concentrations both upstream and downstream of Rockwell is similar. He contends that this evidence indicates that Rockwell's introduction of Aroclor 1254 to the River had no impact.

There is insufficient evidence of the sampling techniques used by Mr. Barrick to conclude that the sampling was taken from depositional areas where PCBs from Rockwell's oils would be expected to have come to rest. Moreover, while the gas chromatograph may be evidence that Rockwell's contribution of PCBs to the River was insignificant compared to that of the Plaintiff's members and others upstream, it does not conclusively demonstrate that Rockwell's release of PCBs to the River was not regular, or more than incidental.

In light of the high concentration of PCBs found at the outfall of the Oil Floatation House, and the presence of PCBs in all of the oil handling areas on the Rockwell property, the Court must conclude that Rockwell's release of PCBs to the River was

more than incidental or sporadic. The evidence is sufficient to enable the Court to conclude that PCBs were regular ingredients of the Rockwell plant's process oils, at least for a period of time, and that they were released to the Kalamazoo River in measurable or detectable quantities.

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At this stage of the proceedings the Court is not called upon to quantify Rockwell's release of PCBs to the River. While the evidence tends to show that the release was minimal in comparison to the release of PCBs by Plaintiff's members, the Court is satisfied that the release was above the threshold of significance. Accordingly, the Court finds in favor of Plaintiff on the issue of Rockwell's liability for the release of PCBs to the Site.

An order and partial judgment consistent with this opinion will be entered.

Date: December 7, 1998

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ROBERT HOLMES BELL

UNITED STATES DISTRICT JUDGE

(Cite as: 107 F.Supp.2d 817)

United States District Court, W.D. Michigan, Southern Division.

KALAMAZOO RIVER STUDY GROUP, Plaintiff, v. ROCKWELL INTERNATIONAL, et al., Defendants.

No. 1:95-CV-838.

June 3, 2000.

Association of paper companies sued manufacturing plant owner under Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and Michigan Natural Resources and Environmental Protection Act (NREPA), seeking contribution for response costs incurred in responding to releases of polychlorinated biphenyls (PCB) into river. Following bench trial, the District Court, Robert Holmes Bell, J., entered judgment against plant owner as to liability only. Following trial on allocation, the Court held that paper companies were not entitled to contribution, in view of relatively minimal release of PCB by plant owner.

Order accordingly.

#### West Headnotes

11 Environmental Law 447 149Ek447 Most Cited Cases (Formerly 96k7)

Factors in allocating contribution recovery under CERCLA include: (1) ability of parties to demonstrate that their contribution to a discharge, release or disposal of a hazardous waste can be distinguished; (2) amount of hazardous waste involved; (3) degree of toxicity of hazardous waste involved; (4) degree of involvement by parties in generation, transportation, treatment, storage, or disposal of hazardous waste; (5) degree of care exercised by parties with respect to hazardous waste concerned, taking into account characteristics of such hazardous waste; and (6) degree of cooperation by parties with federal, state or local officials to prevent any harm to public health or environment. Comprehensive Environmental Response, Compensation, and Liability Act, § 113(f), 42 U.S.C.A. § 9613(f).

## [2] Contribution 9(7) 96k9(7) Most Cited Cases

Courts in allocating CERCLA contribution are not required to make meticulous findings as to precise causative contribution each party has made to a hazardous site. Comprehensive Environmental Response, Compensation, and Liability Act, § 113(f), 42 U.S.C.A. § 9613(f).

# [3] Contribution 9(6) 96k9(6) Most Cited Cases

Plaintiff in CERCLA contribution action may seek reimbursement even though it cannot make a meticulous factual showing as to causal contribution of each defendant; however, plaintiff has burden of proving its case by a preponderance of evidence. Comprehensive Environmental Response, Compensation, and Liability Act, § 113(f), 42 U.S.C.A. § 9613(f).

## [4] Environmental Law 5-2447

149Ek447 Most Cited Cases

(Formerly 199k25.5(5.5) Health and Environment, 96k5(6.1))

Under CERCLA, paper companies were not entitled to contribution from manufacturing plant owner for response costs incurred in responding to releases of polychlorinated biphenyls (PCB) into river, where paper companies had released hundreds of thousands of pounds of PCB, while manufacturing plant had released relatively minimal amount which would not in itself have resulted in need for remediation. Comprehensive Environmental Response, Compensation, and Liability Act, § 113(f), 42 U.S.C.A. § 9613(f).

\*818 Alan C. Bennett, Law, Weathers & Richardson, Grand Rapids, Jerome T. Wolf, Sonnenschein Nath & Rosenthal, Kansas City, MO, for Kalamazoo River Study Group, plaintiffs.

Joseph C. Basta, Dykema Gossett, PLLC, Detroit, MI, for Rockwell International Corporation, defendants.

## **OPINION**

## ROBERT HOLMES BELL, District Judge.

In 1995 Plaintiff Kalamazoo River Study Group ("KRSG") filed this action against eight corporations

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under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 ("CERCLA"), 42 U.S.C. § 9601, et seq., the Michigan Natural Resources and Environmental Protection Act ("NREPA"), M.C.L.A. § 324.20101 et seq. and various common law theories. Through this action Plaintiff seeks to recover its response costs from other entities that allegedly contributed to the PCB contamination of a portion of the Kalamazoo River.

Prior to trial six of the Defendants were dismissed pursuant to a voluntarily dismissal, \*819 settlement, or summary judgment. [FN1] The case against the remaining two defendants, Eaton Corporation and Rockwell International, Inc., was tried to the Court in two phases. The liability phase was tried from August 10, 1998 to August 17, 1998 (the Phase I After the Phase I trial this Court entered an opinion, order and partial judgment dated December 8, 1998, entering a judgment in favor of Eaton, and entering a judgment as to liability only in favor of Plaintiff Kalamazoo River Study Group ("KRSG") and against Defendant Rockwell International ("Rockwell"). The Court also entered a judgment as to liability only in favor of Rockwell on its counterclaim against KRSG.

FN1. Plaintiff KRSG's claims against Defendants Benteler Industries, Inc., Upjohn Company, Menasha Corporation, and two of Eaton's facilities were dismissed pursuant to orders granting summary judgment dated February 21, 1997, March 6, 1998, and June 30, 1998. Plaintiff's claims against Wells Aluminum Corporation and Hercules, Inc. were dismissed pursuant to stipulations and orders dated January 20, 1998, and July 16, 1998. Plaintiff's claims against Rock-Tenn Company, were dismissed on September 28, 1998, pursuant to a settlement agreement between the parties.

The allocation phase, involving only Plaintiff KRSG and Defendant Rockwell, was tried to the Court from November 8, 1999 to November 10, 1999 (the Phase II trial). The Court has considered opening statements of counsel, written closing arguments of counsel, proposed Findings of Fact and Conclusions of Law from both parties, the testimony of witnesses at trial, documents and photos admitted as exhibits at trial, and deposition excerpts designated by the parties in the Joint Final Pretrial Order. The Court

has considered what inferences can reasonably be drawn from the direct and circumstantial evidence, and has considered the demeanor and manner of the witnesses who testified at trial in assessing the credibility of and weight to be accorded to the testimony of those witnesses. This opinion contains the Court's findings of fact and conclusions of law, in accordance with Fed.R.Civ.P. 52(a).

### I. The Parties

Plaintiff KRSG is an unincorporated association of four paper companies duly existing under and by virtue of the laws of the State of Michigan. members are Millennium Holdings, Inc. (formerly HM Holdings, Inc./Allied Paper Inc.), a Delaware corporation ("Allied"); Georgia-Pacific Corporation, a Georgia corporation ("Georgia-Pacific"); Fort James Operating Company, Inc. (formerly James River Paper Company, Inc.), a Virginia corporation ("James River"); and Plainwell Inc. (formerly Simpson-Plainwell Paper Company and Plainwell respectively), Paper Company, Michigan corporation ("Simpson").

Defendant Rockwell is a Delaware corporation. Meritor Automotive is the successor in interest with respect to Rockwell's Allegan facility that is at issue in this case.

### II. Administrative History of The Site

In August 1990 a thirty-five mile length of the Kalamazoo River from the confluence of Portage Creek with the river (in the City of Kalamazoo) downstream to the Allegan City Dam, and a three-mile portion of Portage Creek upstream of its confluence with the Kalamazoo River was added to the National Priorities List ("NPL") by the United States Environmental Protection Agency ("EPA") pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605. The NPL Site is known as the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund (National Priorities List) Site ("NPL Site").

In 1990, the Michigan Department of Natural Resources (now the Michigan Department of Environmental Quality) ("MDNR" or "MDEQ") and the EPA signed a Cooperative Agreement authorizing the MDNR to conduct an Endangerment/Risk Assessment for the NPL Site. The MDNR determined that the NPL Site is contaminated with hazardous substances, including polychlorinated biphenyls ("PCBs"). PCBs are hazardous substances \*820 as defined by Section 101(14) of CERCLA, 42

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U.S.C. § 9601(14).

The MDNR identified three paper mills--Allied, Georgia-Pacific and Simpson--as the principal sources of PCBs contaminating the NPL Site due to past business operations involving the recycling of paper, including deinking, during the period of 1950-1975.

In December 1990, following the listing of the NPL Site, three members of KRSG (Allied, Georgia-Pacific, and Simpson) entered into an Administrative Order by Consent ("AOC") with the MDNR to fund and conduct a Remedial Investigation/Feasibility Study ("RI/FS") of the NPL Site. James River subsequently joined the KRSG, but did not sign the AOC. James River has nevertheless participated in the RI/FS process.

In the AOC the MDNR made a finding that the sediments, water column and biota in the Kalamazoo River/Portgage Creek Site are contaminated with PCBs. In 1990 the MDNR estimated that there are about 200,000 pounds of PCBs in the sediments in and adjacent to Portage Creek and the Kalamazoo River at this Site. [FN2] Since then the MDEQ has determined that the river sediments contain well over 350,000 pounds of PCBs. [FN3] PCBs continue to migrate off-site due to the river flow, and substantially contribute to the ongoing contamination of Lake Michigan. [FN4]

FN2. AOC, at 2, Tr. Ex. 8803.

FN3. MDEQ 3/19/97 Briefing Report, Tr. Ex. 8810.

FN4. AOC at 2, Tr. Ex. 8803.

Under the RI/FS Plaintiff's members are required to extend their investigation upstream and downstream of the NPL site to include a ninety-five mile stretch of the Kalamazoo River from upstream of Morrow Lake to downstream of the Rockwell facility and four Operable Units ("OUs") consisting of five disposal areas used to dispose of paper making residuals or "sludges" from the KRSG members' mills. The OUs include: (1) Allied Paper, Inc/Bryant Mill Pond (operated by Allied); (2) Willow Boulevard/A-Site (operated by Georgia- Pacific); (3) King Highway Landfill (operated by Georgia-Pacific); and (4) the

12th Street Landfill (operated by Simpson). MDNR determined that each of the respondents Georgia-Pacific and Simpson) is a (Allied, "responsible party" under Section 107(a) and a "potentially responsible party" ("PRP") within the meaning of Section 122 of CERCLA, 42 U.S.C. § § 9607(a) & 9622; that the Site is a "facility" within the meaning of Section 101(9) of CERCLA, 42 U.S.C. § 9601(9); that there were and are "releases" and the threat of continuing releases of "hazardous substances" at or from the Site within the meaning of Sections 101(22) and 101(14) of CERCLA, 42 U.S.C. § § 9601(22) and 9601(14); and that the response actions called for in the AOC are consistent with the National Contingency Plan ("NCP"), 40 C.F.R. Part 300. [FN5]

FN5. Id. at 3-4.

The AOC requires the Respondents to perform and pay for the RI/FS activities in accordance with the applicable Statement of Work ("SOW"); to perform and pay for any additional tasks conducted independently of the AOC as determined to be necessary by the MDNR to perform the RI/FS activities required by the AOC; and to reimburse the MDNR for all direct and indirect costs incurred by the MDNR in overseeing and reviewing the conduct of activities required under the AOC. [FN6] Under the AOC, the Respondents are jointly and severally liable for the performance of the RI/FS activities specified in the AOC and for any penalties arising from the AOC. The AOC does not purport to include as respondents all persons that may have caused or contributed to the disposal of PCBs or other hazardous substances at the Site.

FN6. Id. at 4-5.

\*821 During Phase I of this case, this Court held that "[t]he contributions of PCBs to the NPL Site by Allied, James River, Georgia-Pacific and Simpson, individually and together, are in nature, quantity and durability sufficient to require imposing the costs of response activities for the NPL Site upon each of those four parties." \_[FN7] This Court also determined that "[i]n light of the high concentration of PCBs found at the outfall of the Oil Floatation House, and the presence of PCBs in all of the oil handling areas on the Rockwell property ... Rockwell's release of PCBs to the river was more

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than incidental or sporadic. The evidence is sufficient to enable the Court to conclude that PCBs were regular ingredients of the Rockwell plant's process oils, at least for a period of time, and that they were released to the Kalamazoo River in measurable or detectable quantities." [FN8] In sum, this Court adjudged both KRSG and Rockwell liable under CERCLA for PCB contamination at the Site. This Court also observed that Rockwell's release of PCBs appeared to be minimal in comparison to the release of PCBs by Plaintiff's members.

<u>FN7.</u> KRSG v. Rockwell, 12/8/98 Opinion at 41-42.

FN8. Id.

### III. KRSG's Response Costs

The parties have stipulated that the response costs incurred by Plaintiff for the work conducted relating to the RI/FS at the Site, including the work conducted by Blasland, Bouck & Lee ("BBL") and the oversight work conducted by the MDEQ, were necessary and consistent with the National Contingency Plan.

RI/FS-related activities of the investigations conducted by Plaintiff at the Site have not been associated specifically with the locations of individual KRSG member facilities due to the wholeriver nature of the investigation. Plaintiff, through August, 1999, has paid approximately \$21 million to BBL for work relating to the RI/FS. Of that \$21 million, approximately \$8.6 million relates to activity conducted by BBL adjacent to and downstream from Rockwell's Allegan facility, plus general river (sediment, water and biota) investigation for the entire ninety-five mile stretch of the river at issue in this litigation, excluding specific PCB testing between the upstream-most KRSG member and Rockwell's Allegan facility. [FN9] None of the \$8.6 million relates to costs Plaintiff has incurred relating to Plaintiff's members' mills, the OUs at the NPL site, work performed by Seyferth & Associates, or Plaintiff's search for other potentially responsible parties.

<u>FN9.</u> Dr. Mark P. Brown testimony, 11/9-10/99 at 20, 30-31; Blasland Bouck & Lee Costs, Tr. Ex. 4228.

Plaintiff, through August, 1999 has paid the MDEQ approximately \$3.1 million for oversight costs incurred by MDEQ relating to the RI/FS. The MDEQ's activities at the Site generally shadowed BBL's activities, and therefore it is appropriate to take the same percentage of BBL's total costs that related to the general river investigation to determine the portion of MDEQ's total oversight costs that relate to the general river investigation. approximately \$1.2 million of the \$3.1 million expended by MDEQ is attributable to general river (sediment, water and biota) investigation for the entire ninety-five mile stretch of the Kalamazoo River at issue in this litigation, excluding specific PCB testing between the upstream-most KRSG member and Rockwell's Allegan facility.

Plaintiff's individual group members have allocated among themselves their percentage shares for response costs at the Site as follows: 35 percent to Allied, 35 percent to Georgia-Pacific, 15 percent to Plainwell and 15 percent to James River. [FN10]

<u>FN10.</u> Brown testimony 11/10/99 at 102-03; Lettinga & Associates September 1999 Invoice, Tr. Ex. 5650.

### \*822 IV. KRSG's Contribution Claim

[1] Section 113(f) CERCLA provides that "[i]n resolving contribution claims, the court may allocate response costs among liable parties using such equitable factors as the court determines are appropriate ...." 42 U.S.C. § 9613(f). Thus, under § 113(f) the Court may consider *any* factor it deems in the interest of justice in allocating contribution recovery. A nonexhaustive list of such factors, commonly referred to as the "Gore Factors," includes:

(1) the ability of the parties to demonstrate that their contribution to a discharge, release or disposal of a hazardous waste can be distinguished; (2) the amount of the hazardous waste involved; (3) the degree of toxicity of the hazardous waste involved; (4) the degree of involvement by the parties in the generation, transportation, treatment, storage, or disposal of the hazardous waste; (5) the degree of care exercised by the parties with respect to the hazardous waste concerned, taking into account the characteristics of such hazardous waste; and (6) the degree of cooperation by the parties with the Federal, State or local officials to prevent any harm

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to the public health or environment

Centerior Service Co v Acme Scrap Iron & Metal Corp., 153 F 3d 344, 354 (6th Cir 1998) (citing United States v Colorado & Eastern Railroad, 50 F 3d 1530, 1536 n 5 (10th Cir 1995)) See also United States v R W Meyer, Inc., 932 F 2d 568, 571 (6th Cir 1991) The Gore factors enable the Court to take into account more varying circumstances than common law contribution R W Meyer, 932 F 2d at 573

Because one of the primary goals of CERCLA is to encourage timely cleanup of hazardous waste sites, and because CERCLA seeks to place the cost of that response on those responsible for creating or maintaining the hazardous condition, the most important factors in the allocation phase are harm to the environment and care on the part of the parties Control Data Corp v SCSC Corp, 53 F 3d 930, 935-36 (8th Cir 1995) Because harm to the environment is a product of volume and toxicity, the parties' assert that the most relevant Gore factors in this allocation phase are volume of discharge, toxicity, and cooperation with governmental authorities

[2][3] Courts are not required to make meticulous findings as to the precise causative contribution each of the parties have made to a hazardous site, as in many cases such a finding would be literally impossible *RW Meyer*, 932 F 2d at 573-74 Similarly, the plaintiff in a contribution action may seek reimbursement even though it cannot make a meticulous factual showing as to the causal contribution of each defendant *Id* at 573-74 Although the CERCLA plaintiff is not required to prove its case with scientific certainty, it still has the burden of proving its case by a preponderance of the evidence *BF Goodrich v Betkoski*, 99 F 3d 505, 526 (2d Cir 1996)

In an appropriate set of circumstances, a tortfeasor's fair share of the response costs may be zero <u>Acushnet Co v Mohasco Corp.</u> 191 F 3d 69, 78 (1st Cir 1999) For example, in <u>PMC, Inc v Sherwin-Williams Co.</u> 151 F 3d 610, 616 (7th Cir 1998), the Seventh Circuit held that even though PMC conceded that it had dumped toxic wastes at the site, it was not unreasonable for the district court to find that a zero allocation to PMC would be appropriate where PMC's spills were "too inconsequential to affect the cost of cleaning up significantly " 151 F 3d at 616 As the First Circuit observed in <u>Acushnet</u>, "there is nothing to suggest that Congress intended to impose far-reaching liability on every party who is

responsible for only trace levels of waste "  $\underline{191 \text{ F } 3d}$  at 78

In this action Plaintiff contends that Rockwell is responsible for contributing 20% of the estimated 50,000 pounds of PCBs in Lake Allegan Based upon Plaintiff's assertion that Aroclor 1254 discharged by Rockwell is 3 to 4 times more \*823 toxic than Aroclor 1242 discharged by Plaintiff's members, Plaintiff requests the Court to allocate to Rockwell a 13% share of the current and future general river investigation costs upstream of the Allegan facility, and a 40% share of current and future study and investigation costs downstream of the Allegan facility, plus prejudgment interest

Rockwell, on the other hand, contends that its releases of PCBs were of such a small quantity as to be negligible, and that the equitable share that should be allocated to Rockwell should be zero

### V. PCBs

PCBs were originally produced in the late 1920s. They were manufactured almost exclusively by Monsanto Corporation and were marketed under the trade name "Aroclor" PCBs were used by industry in a variety of applications, including in dielectric fluids in capacitors and transformers, in hydraulic fluids, in cutting and soluble oils, and in quench oils. The Aroclors pertinent to this case are Aroclor 1242, Aroclor 1248, Aroclor 1254 and Aroclor 1260. The last two numbers in the particular Aroclor mixture signifies the percentage of chlorine within the mixture, the higher the number, the greater the molecular weight of the Aroclor.

PCB Aroclor 1242 is the Aroclor predominantly associated with paper recycling operations, including the recycling operations undertaken by the paper mills operated by Plaintiff's members Aroclor 1242 was used in carbonless copy paper produced by National Cash Register ("NCR paper") as an ink carrier or solvent during the period 1957-1971 [FN11] Over 44 million pounds of PCBs were used for this purpose, accounting for 28 per cent of the total estimated Monsanto sales for plasticizer applications and 63 per cent of Monsanto domestic sales of PCBs during 1957-1971 The average content of Aroclor 1242 in the carbonless copy paper was 34% [FN12] PCB Aroclor 1242 is also associated with hydraulic fluids and heat transfer fluids

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<u>FN11.</u> Versar, Inc., *PCBs Involvement in the Pulp and Paper Industry*, (Feb.1977) at 2. Tr. Ex. 8017.

FN12. Id.

PCB Aroclor 1254 was used in several applications, including quench oils, hydraulic oils, and cutting oils. Aroclor 1254 was also used to a limited extent in printing inks beginning in 1968. [FN13] The total usage in this application is estimated at 50,000 pounds. [FN14]

FN13. Richard B. Valley, Sources of PCB Contamination in the Kalamazoo River, (July 23, 1990), at 1, Tr. Ex. 8804.

FN14. Id. at 3.

PCBs did not become a regulatory concern until the early 1970s. Accordingly, they entered the waste stream from a variety of sources without detection, quantification or concern by industry or government regulators until the 1970s.

PCBs have an affinity for solids or particulate matter, and generally adhere more readily to fine grained particles than to coarse grained particles. PCBs are not very water soluble. [FN15] In a river environment, PCBs are likely to accumulate in the sediment in quiescent areas or depositional zones. When PCBs are discharged to the river in oil, some will float on the surface and be carried down river, and others will attach to particles and eventually settle out and become part of the sediment in depositional zones. The higher the concentration of PCBs in an oil, the heavier the oil, and the closer the PCBs will be found to the discharging source. [FN16]

FN15. Brown testimony, 8/10/98 at 77-79.

<u>FN16.</u> Robert C. Barrick testimony, 11/10/99, at 27-28.

VI. Evidence of Rockwell's PCB Use and Discharge

Rockwell owned property and a manufacturing plant at 1 Glass Street, Allegan. \*824 Rockwell and its predecessors operated that plant from the early 1900s until approximately 1988-89. The plant, which manufactured universal joints for the automotive industry, was located on the Kalamazoo River, downstream of the Allegan City Dam, and upstream of the Lake Allegan Dam.

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The portion of the Kalamazoo River adjacent to the former Rockwell plant is not within the NPL Site as defined by the AOC. It is, however, within the ninety-five mile stretch of river Plaintiff has been required to address in its RI/FS. It is undisputed that to the extent Rockwell may have released PCBs to the Kalamazoo River, those PCBs cannot come to be located within the NPL Site because it is *upstream* of Rockwell.

The former Rockwell Allegan facility is a Superfund Site separate and apart from the Plaintiff's Superfund Site. In 1988 Rockwell entered into an AOC with the EPA to undertake a remedial investigation and feasibility study of the property. The Rockwell property became a Superfund Site because of heavy metals and other chemicals, not because of PCBs.

From 1945 until the early 1960s, Rockwell discharged its industrial wastewater into the Kalamazoo River following treatment in the Oil The wastewater from the Oil Floatation House. Floatation House contained certain amounts of sludge, heavy metals, process wastes, and oil. Rockwell's wastes included machine coolants, oily wastewaters, and spent cutting oils. There are no records indicating that the Rockwell plant purchased quench oils, cutting oils or hydraulic oils containing PCBs. The most substantial releases of oil from the Rockwell facility were from Outfall Number One, the old outfall that received discharges from the Oil Floatation House. The dominant PCB mixture found on the Rockwell property is Aroclor 1254, but evidence of Aroclors 1242 and 1260 was also found.

There is no evidence that Rockwell conducted forging, die casting or other extremely high temperature operations that would have benefitted from the fire-resistant qualities of PCB-containing oil. From the early 1960s onward, Rockwell began making increasing use of water-based process oils, *i.e.*, water- soluble oils. Because PCBs do not readily mix with water, they are an unlikely additive to water soluble oils. Beginning in that time frame, Rockwell discharged its waste oils into the soluble oil separation pond. The wastewater effluent from

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Rockwell's treatment ponds was tested by the MDNR in 1976 and 1986. Those tests found no PCBs in Rockwell's outfall to the Kalamazoo River. [FN17]

<u>FN17.</u> Results from MDNR Industrial Wastewater surveys of March 22-23, 1976, and June 9-10, 1986, Tr. Exs. 5012, 5014, 5025 & 5027.

Rockwell kept no records of its oil purchases from the 1940s to 1970s. Neither did it screen its incoming process oils for PCBs, or test its oils or effluent for PCBs until after Monsanto pulled PCBs from use in open applications in 1971. Because of this lack of information, the parties were prevented from making a precise calculation of Rockwell's PCB discharges to the river and Rockwell's contribution of PCBs to Kalamazoo River sediment. Nevertheless, some reasonable inferences can be drawn from the available evidence.

Based upon the higher cost of PCB-containing oils, the lack of necessity for PCB-containing oils in Rockwell's manufacturing processes, and the low levels of PCBs found on the property, it is unlikely that Rockwell intentionally purchased PCBcontaining oils. Nevertheless, it is likely that Rockwell purchased oils that contained PCBs. Mary Shafer (a/k/a Mary Geika), Project Manager of the Superfund Section of the MDEQ Environmental Response Division, observed that "vendors may not have known [that oils contained PCBs], as tests were not regularly done on oils, to look for PCBs. PCBs were commonly\*825 contained in oils at that time (especially pre-1970)." [FN18] If Rockwell purchased recycled oils, those oils may very well have contained PCBs. In addition, Robert C. Barrick, Rockwell's expert, testified that oils purchased by Rockwell may have been contaminated with traces of PCBs from residue from PCB-containing oils transported in oil tankers. [FN19]

<u>FN18.</u> Shafer letter of November 30, 1993, at 2, Tr. Ex. 1267.

<u>FN19.</u> Barrick testimony, 11/10/99, at 44, 88-89.

Plaintiff's expert, Dr. Kenneth Z. Crumrine, estimated that Rockwell discharged between 5,000

and 10,000 pounds of PCBs to the Kalamazoo River. Dr. Crumrine based his estimate on available data relating to known oil losses to the river in 1965 as documented by the Michigan Water Resources Commission ("MWRC"), and data from Rockwell documents which shed light on the amounts of hydraulic and cutting oils Rockwell historically stored and reclaimed. \_[FN20] Dr. Crumrine's estimate is basically extrapolated from the March 9-11, 1965, MWRC survey of the outfall from the Oil Floatation House. The survey found that Rockwell discharged 270 gallons of oil to the Kalamazoo River from the Oil Floatation House in a twenty-four hour period on March 9-10, 1965. After the oil storage and separation tanks were pumped out on March 10, a second survey was done, and Rockwell's oil discharge was reduced to approximately 5.1 gallons. [FN21] Using only these two figures, Dr. Crumrine estimated Rockwell's release of hydraulic and cutting oils to the Kalamazoo River over a thirty-two year Dr. Crumrine used the high number (270 gallons per day) for the five years of 1941 to 1945, and the low number (5.1 gallons per day) for the next twenty-seven years of 1946 through 1972. [FN22] Dr. Crumrine estimated that the total amount of oil released over this thirty-two year period was 520,695 gallons. Dr. Crumrine attempted to verify this figure by comparing it to data regarding the size of Rockwell's oil tanks, and sparse documentation regarding Rockwell's oil reclamation efforts. [FN23]

<u>FN20.</u> Dr. Kenneth Z. Crumrine testimony, 11/8/99, at 50-51, 75-92, 99; Tr. Exs. 1239, 1241, 1128, 1407, 1408, 1410 & 1411.

<u>FN21.</u> MWRC Report of Survey at Rockwell, March 9-11, 1965, Tr. Ex. 1064.

FN22. Crumrine testimony, 11/8/99, at 76.

FN23. Dr. Crumrine estimated that Rockwell used 40,000 gallons of hydraulic fluid and 20,000 gallons of cutting fluid per year. He calculated a total usage of 1,920,000 gallons of oil over the 32 year period. Crumrine testimony, 11/8/99, at 85-88.

Based upon the PCB content of Monsanto hydraulic oils and cutting oils, Dr. Crumrine concluded that

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Rockwell is responsible for the discharge of a minimum of 5,000 to 10,000 pounds of PCBs to the Kalamazoo River. [FN24]

<u>FN24.</u> Crumrine testimony, 11/8/99 at 94-102.

Dr. Crumrine's calculations are highly speculative. The Court is not persuaded that Dr. Crumrine's estimate of the total volume of oil released by Rockwell is very probative because his thirty-two year estimate is an extrapolation from one data point. Dr. Crumrine contends that his estimate is conservative because it gives Rockwell the benefit of peak efficiency of the Hog House from 1945 to 1972, a fact known not to be true, and the most favorable discharge scenario for Rockwell from the period 1941 to 1945, when in actuality no system of any kind was in place to control oil discharges to the river. The estimate further does not account for PCB releases from other river outfalls at the Allegan facility, does not account for known seeps of oils to the river from Rockwell's sludge pit area, which area has tested positive for PCBs, and does not account for losses from the wastewater treatment ponds, which also tested positive for PCBs. [FN25]

<u>FN25.</u> Crumrine testimony, 11/8/99, at 63-73, 169-71.

\*826 Notwithstanding Dr. Crumrine's assertions as to the conservative nature of his estimate, Plaintiff has produced no evidence that the two-day survey in 1967 was representative of Rockwell's daily activities over the thirty-two year period. Dr. Crumrine's estimate assumes, without evidentiary support, that Rockwell's daily oil use and discharges to the river remained constant--without evidence of how often the weir was cleaned, how thoroughly it was cleaned on March 10, 1965, or whether industrial oil usage remained constant.

A single measurement of a discharge, taken at a single location and point in time, should not be the basis for extrapolation to a multi-year time period, at least not without sufficient corroborative evidence that the single point was representative. See <u>Textron Inc. By and Through Homelite Div. v. Barber-Colman Co., 903 F.Supp. 1546, 1555 (W.D.N.C.1995)</u> (where a claim rests on wastewater test results from one year, those test results are not

significantly probative absent evidence indicating they are typical); <u>Renaud v. Martin Marietta Corp.</u>, 749 F.Supp. 1545, 1553 (D.Colo.1990), affirmed 972 F.2d 304, 308 (10th Cir.1992) ("It is unsound scientific practice to select one concentration measured at a single location and point in time and apply it to describe an 11-year period.").

Even if the Court were to assume that Dr. Crumrine's estimate of the volume of oils released is correct, the Court would still be faced with a matter of much greater concern--his estimate of the level of PCBs contained in that oil. Central to Dr. Crumrine's calculation was his assumption that the hydraulic oils used by Rockwell contained 50% PCBs, based upon Monsanto records showing that its PCB-containing hydraulic fluids contained 40-70% PCBs (400,000 ppm to 700,000 ppm). [FN26] Dr. Crumrine assumed that the cutting oils contained 5% PCBs (50,000 ppm), also based on Monsanto records. Dr. Crumrine's calculation assumes a level of PCBs that would be found in oils purchased from Monsanto for their PCB-containing quality. As noted earlier, the evidence does not support the assumption that all of the hydraulic and cutting oils purchased by Rockwell from 1940 to 1972 were Monsanto oils containing PCBs. In fact, this assumption is contradicted by the actual site data from the Rockwell property.

FN26, Id. at 92-93.

The Rockwell property rests on a layer of "light non-aqueous phase liquid," or "LNAPL." LNAPL is oil floating on groundwater. When oil is too heavy to float on the groundwater, it is called "dense non-aqueous phase liquid," or "DNAPL." [FN27] If the hydraulic oils used by Rockwell were 50% PCBs as posited by Dr. Crumrine, those oils would be denser than water, and would sink below the water, to be found as DNAPL deposits. No DNAPL has ever been detected on the Rockwell property. [FN28]

FN27. Barrick testimony, 11/10/99, at 101.

FN28. Id.

The highest concentration of PCBs found anywhere on the Rockwell property was 9 ppm of Aroclor 1254 found in the LNAPL. Aroclor 1254 was found in soil at concentrations of between .34 ppm and 1.6

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ppm, and in the groundwater at concentrations of between 0.3 ppb and 3.5 ppb. Rockwell's expert, Mr. Barrick, testified convincingly that it is physically impossible, under the circumstances at the Rockwell property, for cutting oil with a PCB concentration of 50,000 ppm or a hydraulic oil with a concentration of 500,000 ppm to be reduced to the 9 ppm concentration found in the LNAPL on the property. [FN29] Mr. Barrick concluded that the low level PCBs found on Rockwell's property were more likely the result of the handling and spilling of oils that were incidentally contaminated with PCBs.

FN29. Id. at 102-104.

\*827 This Court finds the opinion of Mr. Barrick more persuasive than the opinion of Dr. Crumrine. Based upon the low concentrations of PCBs found on the Rockwell property, it does not appear that Rockwell purchased PCB- containing hydraulic fluid from Monsanto. There is no basis for concluding that the oils used in manufacturing by Rockwell contained significantly greater proportions of PCBs than the concentrations found in the LNAPL. Plaintiff has presented no credible or persuasive scientific evidence by which to conclude that oils containing 5 to 50 % PCBs could be used regularly and discharged for thirty-two years and nevertheless yield LNAPL containing less than 10 ppm of PCBs. [FN30] By contrast, the effects of discharges from NCR paper are seen clearly everywhere in the river, by clear detections of significant amounts of PCBs, even though NCR paper contained only 3.4% PCBs. [FN31] Based upon the evidence presented, the Court concludes that the oil in the LNAPL layer found on the Rockwell property is more characteristic of incidental PCB contamination in the oils used by Rockwell than a steady purchase of PCB-containing oils manufactured by Monsanto. [FN32]

FN30, Id. at 102-104.

<u>FN31.</u> See Versar Report, at 2-3, Tr. Ex. 8017.

FN32. Barrick testimony, 11/10/99, at 102.

Thus, even if the Court were to accept Dr. Crumrine's assumptions regarding the volume of oil

discharged, the PCBs associated with that volume would be far less than the figures suggested by Dr. Crumrine. If the Court were to assume PCB concentrations of 9.2 ppm, the highest concentration of PCBs found in Rockwell's LNAPL, there would be a release of approximately 8 pounds of PCBs. Even if the Court were to use the highest PCB concentration associated with Rockwell, the 35 ppm found in the sediment by the outfall from the Oil Floatation House, the total release would be approximately 16 to 20 pounds. [FN33]

FN33, Id. at 113.

Assuming releases as Dr. Crumrine suggested, and assuming approximately 50,000 pounds of PCBs in Lake Allegan, the PCB discharge by Rockwell at a concentration of 9.2 ppm PCBs, would yield a theoretical contribution of no more than .002% of the total mass of PCBs in Lake Allegan. [FN34] Alternatively, if the Court were to use the highest PCB detection near the Rockwell property, 35 ppm, it would yield a theoretical contribution of approximately .008%. In any event, such a contribution, if it occurred, is negligible and does not rise above background concentrations of PCBs in the river. [FN35]

<u>FN34.</u> *Id.* at 114-15.

FN35. Id. at 112-115.

Plaintiff contends it is inappropriate to use the 35 ppm, or any other PCB level found on Rockwell's property, as the multiplier for calculating Rockwell's PCB contribution to the river because Rockwell discharged these oils to the river with these high levels of PCBs through discharge pipes without dilution. [FN36] Dr. Crumrine testified that the fact that lower concentrations were found on Rockwell's property is neither surprising nor uncommon, and is consistent with findings at other NPL sites where PCBs are found.

FN36. Crumrine testimony, 11/8/99, at 178-79.

Dr. Crumrine's general reference to other sites where

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there was little contamination on the site itself, yet high concentrations of PCBs in an adjoining water body [FN37] is not sufficient to refute Mr. Barrick's explanation on why the relatively low level of PCBs on the ground, in the groundwater and in the LNAPL at Rockwell cannot be reconciled with the usage of 50% PCB-containing hydraulic fluids. Dr. Crumrine did not discuss any other sites where a comparison could be made with \*828 the PCBs in the LNAPL at Rockwell. Because PCBs adhere to the oils, it is unlikely that they would have been used in such high concentrations but would not be found in high concentrations in the LNAPL. Finally, Dr. Crumrine's estimate ignores evidence that from the early 1960s on, Rockwell began making increasing use of water-soluble oils that would be even less likely to contain PCBs.

FN37. Id. at 179.

For all these reasons, the Court rejects Dr. Crumrine's opinion that Rockwell released 5,000 to 10,000 pounds of PCBs to the Kalamazoo River. The Court finds more persuasive Mr. Barrick's estimate that the total PCBs released by Rockwell were not likely to have exceeded 20 pounds.

## VII. Evidence of KRSG Members's PCB Use and Discharge

The four members of plaintiff KRSG have operated paper recycling mills conducting recycling and deinking operations, adjacent to the Kalamazoo River or Portage Creek, within the NPL Site. Each of the mills owned by KRSG's members performed deinking or used carbonless copy paper as a component in their feedstock at some point in the past. [FN38] From the 1950s through the 1970s, carbonless copy paper was often found in office waste paper, and office waste paper provided the furnish for recycling operations by each of the plaintiff's member companies. The average content of Aroclor 1242 in carbonless copy paper was 3.4 percent (34,000 ppm). [FN39] Plaintiff's members have each contributed PCBs to the NPL Site in large quantities, on a regular basis, and over a long period of time, as a result of their deinking and paper recycling operations. [FN40] Plaintiff's principal expert, Dr. Mark Brown, conceded that it is likely that most of the Aroclor 1242 found in the river came from the paper recycling industry. [FN41] NCR paper was not the only source of PCBs contributed by the paper companies. Printing inks and transformers

also contained PCBs.

FN38. Hanson dep. at 28-30 (Georgia-Pacific); Gilman 6/20/97 dep. at 30-31, 107-108 (Allied); Huisman dep. at 24-25 (James River); Lawton dep. at 72-75 (Simpson); Brown Company (predecessor of James River) memoranda of 6/14/76 & 6/21/76, Tr. Ex. 8012 & 8013.

FN39. Versar Report, Tr. Ex. 8017.

FN40. Brown testimony, 8/10/98, at 112-43; MDEQ August 1997 Information Packet re Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site, Tr. Ex. 8811; EPA April 17, 1998 Action Memorandum, Tr. Ex. 8812; EPA May 28, 1998 Addendum to Action Memorandum, Tr. Ex. 8813.

FN41. Brown testimony, 8/10/98, at 91-92.

Any equitable allocation of clean-up costs must consider the relative volume of PCBs contributed by the various parties. The KRSG members admit that waste containing detectable levels of PCBs have been released from their paper-making facilities to either Portage Creek or the Kalamazoo River within the NPL Site. Plaintiff's proposed findings of fact and conclusions of law, however, contain no findings of fact with respect to the volume of PCBs discharged by its member companies. The Court is confounded by Plaintiff's request for an allocation of costs between its members and Rockwell, and its contemporaneous refusal to offer the Court any guidance with respect to one of the most important factors in such an allocation--the volume of PCBs released by its own members.

Defendant Rockwell has produced evidence with respect to PCB releases by Plaintiff's member companies. Because Plaintiff has offered no evidence to rebut the evidence produced by Rockwell on the issue of PCB discharges by Plaintiff's members, the Court relies heavily on Rockwell's findings of fact with respect to PCB contributions by the KRSG members.

The Court recognizes that Plaintiff is not seeking contribution from Rockwell for the remediation of

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the PCBs at Plaintiff's member's landfills or at the facilities themselves. \*829 The PCB contamination at these sites is nevertheless an important key to understanding the quantity of PCBs in the wastes generated by these operations and discharged into the river.

### A. Allied Paper Company, Inc.

Of the four KRSG members, Allied Paper was the largest manufacturer. Allied operated three mills within the NPL Site: Bryant Mill, Monarch Mill and King Mill. These mills practiced deinking from the 1950s through 1971. [FN42] During the 1950's and 60's Allied operated the largest waste paper deinking operation in the world. [FN43] The deinking capacity at the Allied mills complex was listed at 100 tons per day in 1960 and 1962, and at 350 tons per day in 1965. [FN44] As one of the largest paper manufacturing facilities, Allied probably discharged the most waste. [FN45]

<u>FN42.</u> Technical Memorandum 15, pp. 1-1--1-6, Tr. Ex. 8715.

<u>FN43.</u> Allied 1960 Document for Distributors, at 3, Tr. Ex. 8236.

FN44. Valley Report, at 4, Tr. Ex. 8804.

FN45. Brown testimony, 8/11/98, at 136-37.

Prior to 1953, there was no wastewater treatment at Monarch. Wastewater was discharged directly into Portage Creek. Beginning in 1953, Monarch installed a clarifier, but the clarifier effluent was still discharged to Portage Creek upstream of Bryant Mill Pond. [FN46] From the mid-1950s on, the Bryant clarifier was also discharged to Portage Creek upstream of Bryant Mill Pond. It was not rerouted to the City's treatment plant until the early 1970s. [FN47] Throughout its operation, the King clarifier effluent was discharged to the Kalamazoo River through the King Highway storm sewer. [FN48] In 1961, Allied discharged 156,494 pounds per day of suspended solids to the Kalamazoo River and Portage Creek. [FN49] This data only reflects discharges from the clarifiers, and does not include suspended solids in waste waters that were bypassed directly to Portage Creek or the Kalamazoo River.

<u>FN46.</u> Falvey dep. at 11-23.

FN47. Falvey dep. at 39-43.

<u>FN48.</u> Falvey dep. at 27-30.

<u>FN49.</u> Chart of suspended solids-pounds/day, Tr. Ex. 8232.

During the entire time that Allied was engaged in deinking, Allied experienced recurrent breakdowns with the operation of its various waste treatment systems. periodic bypasses of untreated waste from deinking operations occurred at each of the mills. Periodically, from the 1950's through the 1970's, MDNR staff and other witnesses observed bypasses of untreated wastes into Portage Creek and Bryant Mill Pond and observed the Pond itself to be a milky white color. [FN50]

FN50. Kalamazoo Inter-Office Correspondence, January 20, 1958, Tr. Ex. 8202; MWRC correspondence and memoranda of August 2, 1961, May 28, 1965, June 16, 1965, July 14, 1970, November 19, 1975, and March 21, 1983, Tr. Exs. 8205, 8207, 8208, 8209, 8214, & 8222.

Allied disposed of its paper-making residuals at the Bryant Mill Pond, Bryant Sludge Beds, and Monarch Mill Pond landfills. The EPA has concluded that Allied's Bryant Mill Pond is the most important upstream source of PCB- contamination at the Site and to the Kalamazoo River. [FN51] In seventy-four surficial samples throughout the Bryant Mill Pond, the average PCB concentration is 110 ppm. At the landfills operated by Allied, there were PCB concentrations as high as 2000 ppm in the residuals/soil samples. [FN52] In 222 subsurface samples from the pond sediments, the average PCB concentration is 63 ppm. [FN53] At the Allied King Mill, PCBs were detected \*830 in the former lagoon at levels as high as 79 ppm. [FN54]

FN51. EPA May 28, 1998, Addendum to

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Action Memorandum, at 2, Tr. Ex. 8813.

<u>FN52.</u> Draft Technical Memorandum 7, at 34 and Table 3-10, Tr. Ex. 8719.

<u>FN53.</u> *Id.* at 35; Brown testimony, 8/11/98, at 117-119.

<u>FN54.</u> Brown testimony, 8/11/98, at 135; Technical Memorandum 15, Table 3-10, Tr. Ex. 8715.

The Bryant Mill ponds were drained in July 1972, washing sediments from it downstream, and contributing to the PCB enrichment of Portage Creek by exposing these sediments to additional water surface, erosion and decomposition. [FN55]

FN55. Allied Paper Mill Outfall Data, MWRC, January 1973, at KB00203511, Tr. Ex. 8235.

In 1976 Bryant Mill Pond was again lowered, and sediments from the pond were washed downstream into the Kalamazoo River. Over a three week period, Portage Creek turned a gray-black color from pond sediments that were churned up and transported over the dam during the lowering process. During this time period, Portage Creek water samples showed PCB levels ranging between 92.7 to 292 ppb in the water traveling over the Alcott Street Dam toward the Kalamazoo River. [FN56]

FN56. Allied May 11, 1976 letter to MDNR, Tr. Ex. 8216. See also Falvey dep. at 135; Harvey dep. at 133; Brooks dep. at 97-98; Cornelius dep., Sept. 8, 1997, at 36-37.

Sampling and analysis of floodplain sediment in the Bryant Mill Pond Area disclosed PCB-levels as high as 1,000 ppm with surface sediment concentrations exceeding 500 ppm. [FN57] In September 1999, because of the continuing risk to human health and the environment, the EPA removed 150,000 cubic yards of Bryant Mill Pond sediments within Portage Creek. Approximately 10 tons of PCBs were removed at this time. This was nearly double the

amount of paper waste and PCBs expected to be found when EPA began the removal action. [FN58]

FN57. EPA April 17, 1998, Action Memorandum, at 2, Tr. Ex. 8812.

FN58. EPA Action Memorandum and Addendum re Removal Action, Tr. Exs. 8812 & 8813; Cornelius dep., 10/12/99, at 15-20.

In addition to releases of PCBs caused by deinking operations, the EPA filed a civil administrative action against Allied for leakage of PCBs from transformers in violation of the Toxic Substance Control Act. [FN59]

FN59. 1981 Versar Report on PCB Inspection of Allied's facility, Tr. Ex. 8220; 1982 EPA Complaint, Tr. Ex. 8221.

### B. Georgia-Pacific

The Georgia-Pacific mill in Kalamazoo, located on King Highway, in Kalamazoo, was formerly known as the Kalamazoo Paper Company. The company practiced deinking from the 1950s to the present. [FN60] Company records reveal that Georgia-Pacific de-inked up to 200 tons of waste paper per day. Georgia- Pacific ranked behind only Allied Paper in terms of the size of its deinking operations in the Kalamazoo River Valley. [FN61] NCR carbonless copy paper comprised 10% of the furnish in one of Georgia-Pacific's deinking operations. [FN62]

<u>FN60.</u> Technical Memorandum 15, p. 1-1, Tr. Ex. 8715.

FN61. Valley Report, at 4, Tr. Ex. 8804.

FN62. Hanson dep. at 27-30.

Prior to 1954, all industrial wastewater was discharged directly to the Kalamazoo River. In 1954, a primary treatment clarifier was installed. Until 1964, overflow from the clarifier went to the

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Kalamazoo River. From 1964 on, the effluent from Georgia Pacific's clarifier was sent to the Kalamazoo Waste Water Treatment Plant. During most of the 1950's, Georgia-Pacific's paper residuals were pumped from the clarifier to adjacent sludge dewatering lagoons located along the river. In the late 1950's, the King Highway de-watering lagoons were constructed on the opposite side of the Kalamazoo River and paper sludge, at two to four percent solids, was pumped across the river via pipeline for \*831 dewatering in the unlined lagoons. [FN63]

<u>FN63.</u> Technical Memorandum 15, at 1-1 and 1-2, Tr. Ex. 8715.

Paper sludge was periodically excavated from the de-watering lagoons and disposed of at the Willow Boulevard landfill until 1975, when the landfill reached capacity. From 1975 to 1987, the paper sludge was disposed of at the landfill known as the Willow Boulevard/A-Site (an area formerly operated by Allied as de-watering lagoons). After this time, sludges were disposed of at the King Highway Landfill, a landfill created over the top of the old Georgia- Pacific de-watering lagoons. [FN64]

<u>FN64.</u> Technical Memorandum 15, at 1-1 and 1-2, Tr. Ex. 8715; Cornelius dep. 10/12/99, at 26-31.

There is no visible berm or storm water collection system at the Willow Boulevard Landfill. PCB-contaminated paper residuals have been identified in areas throughout the landfill and extend into the Kalamazoo River adjacent to the Landfill. PCB-contaminated paper residuals continuously erode from the Willow Boulevard Landfill into the Kalamazoo River. [FN65]

<u>FN65.</u> Technical Memorandum 9, at 39, Tr. Ex. 8738; Cornelius dep., 9/8/97, at 26-29, 102-114; Cornelius dep., 10/12/99, at 26-31.

PCB-contaminated sludges have also been identified in areas throughout the King Highway Landfill. Prior to the placement of a steel wall between the landfill and the river, PCB-contaminated paper residuals from the King Highway Landfill eroded into the river. [FN66] PCB-contaminated paper residuals are located in the King Highway storm sewer on the west boundary of the landfill, and extend into the Kalamazoo River. indicates that these PCB- contaminated residuals in the river originated from Allied's King Mill which utilized the storm sewer for its waste water discharges. The PCB-contaminated paper mill discharges from the King Highway storm sewer formed a paper sludge "delta" extending into the Kalamazoo River. The volume of these residuals is well over 33,000 cubic yards and contain PCB concentrations up to 190 ppm. [FN67] In 1996, PCBs were detected in four out of five surface samples from the former lagoon areas next to the old Georgia-Pacific clarifier in concentrations as high as 110 ppm. [FN68] PCBs were also detected in sediment from Georgia-Pacific's storm water drainage system, which discharges to the Kalamazoo River. PCBs were also detected in a remnant of waste water from the old Georgia-Pacific clarifier. [FN69]

FN66. Cornelius dep., 10/12/99, at 34.

<u>FN67.</u> Technical Memorandum 15, at 2-5, Tr. Ex. 8715; Technical Memorandum 6, at 29-31 & Table 3-9, Tr. Ex. 8725; Cornelius dep., 10/12/99, at 35-38.

<u>FN68.</u> Brown testimony, 8/11/98, at 132-33; Technical Memorandum 15, Table 3-2, Tr. Ex. 8715.

<u>FN69.</u> Brown testimony, 8/11/98, at 133; Technical Memorandum 15, at 3-1--3-2, Tr. Ex. 8715.

The Willow Boulevard Landfill operated by Georgia Pacific contains PCB levels in surface samples as high as 270 ppm, with an average of about 88 ppm, and subsurface PCB concentrations as high as 160 ppm, with an average of about 54 ppm. [FN70] There is no stormwater berm at the Willow Boulevard landfill, and therefore PCB-contaminated residuals in the landfill are a continuing source of PCBs to the Kalamazoo River. There are an estimated 1900 cubic yards of paper waste located in the river adjacent to the landfill. [FN71] The maximum PCB concentration in paper residuals

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present in the river adjacent to the Willow Boulevard Landfill is 44 ppm with an average \*832 of 11 ppm. [FN72]

<u>FN70.</u> Brown testimony, 8/11/98, at 126-27; Technical Memorandum 9, p. 24, and Table 3-11, Tr. Ex. 8738.

<u>FN71.</u> Brown testimony, 8/11/98, at 126-28; Cornelius dep., 9/8/97, at 26; Technical Memorandum 9 at 25, 39, Tr. Ex. 8738.

FN72. Technical Memorandum 9, at 25, Tr. Ex. 8738; Brown testimony, 8/11/98, at 126; Cornelius dep., 9/8/97, at 26, 103-104.

PCB concentrations in the subsurface at the A-Site Landfill used by both Georgia Pacific and Allied are as high as 330 ppm, with an average detected concentration of about 55 ppm. [FN73] The King Highway Landfill operated by Georgia Pacific had subsurface concentrations as high as 310 ppm. [FN74]

<u>FN73.</u> Brown testimony, 8/11/98, at 127; Technical Memorandum 9, at 24 and Table 3-9, Tr. Ex. 8738.

<u>FN74.</u> Brown testimony, 8/11/98, at 128-30; Technical Memorandum 6, Table 3-9, Tr. Ex. 8725.

In 1999 Georgia Pacific excavated PCB-contaminated waste from five former sludge lagoons on its mill property including waste in a flood plain that extended into the Kalamazoo River, but declined to excavate paper waste located in the river. Georgia Pacific also declined to excavate PCB-contaminated paper residuals located in the river off of the King Street storm sewer. Accordingly, these wastes continue to release PCBs into the river. [FN75]

<u>FN75.</u> Cornelius dep., 10/12/99, at 41-43, 46-47. Brown testimony, 11/10/99, at 58-59.

### C. Simpson-Plainwell Paper Company

The Simpson-Plainwell paper mill practiced deinking from 1910 through 1962 at its Plainwell, Michigan, mill. Various types of waste paper were recycled at the Simpson Mill, including office paper. An internal inquiry revealed that there were significant quantities of NCR type papers in the waste. [FN76] Wastewater was discharged directly into the Kalamazoo river until 1954, when a clarifier was installed. The clarified effluent was discharged into the Kalamazoo River. [FN77]

FN76. Lawton Dep. at 72-75.

FN77. Technical Memorandum 15, p. 1-2, Tr. Ex. 8715.

In 1962 the Plainwell Mill listed deinking at 60 tons per day. [FN78] A document summarizing waste disposal practices through 1960 refers to a range of deinking volumes of 300 to 900 tons per month with suspended solids discharges to the river averaging 14,000 to 34,000 pounds per day. [FN79] PCBs were detected in samples from the end of a former discharge pipe from the Plainwell Mill at concentrations of 240 ppm. [FN80]

FN78. Valley Report, at 4, Tr. Ex. 8804.

FN79. Hamilton Paper Company Report on Waste Disposal, 1947 to July 1960, Tr. Ex. 8600.

FN80. Brown testimony, 8/11/98, at 134-35; Technical Memorandum 15, Table 3-5, Tr. Ex. 8715.

Annual waste water reporting forms filled out by Simpson for the MWRC during the 1970s, which reflect estimates of discharges of critical materials from Simpson's outfalls to the Kalamazoo River, indicate annual discharges of PCBs ranging from less than 11 pounds to between 11 and 100 pounds. [FN81]

FN81. MWRC Wastewater Outfall Reports,

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Tr. Exs. 8617 & 8619.

From the early 1950's through the early 1980's, Simpson used the 12th Street Landfill, located adjacent to the Plainwell Dam on the Kalamazoo River, for disposal of its paper residuals. PCBs have been detected in paper residuals located in areas throughout the Twelfth Street Landfill. [FN82] The maximum PCB concentration at the site is 158 ppm, with an average of 19 ppm or 42 ppm. [FN83] No consistent berm or storm water collection system existed at \*833 the landfill. Although a berm has been constructed around the perimeter of the fill area of the 12th Street Landfill, the berm is constructed of paper residuals along with sand and gravel. Some PCB-contaminated sludges have been identified on the outside of the berm, on the banks of the Kalamazoo River and into the wetland area adjacent to the landfill. [FN84] PCB- contaminated residuals continue to erode into the river from the 12th Street Landfill through wind erosion and in areas where the river is in direct contact with paper sludge. [FN85]

<u>FN82.</u> MDEQ July 1997, Proposed Plan Fact Sheet, 12th Street Landfill, at 3, Tr. Ex. 8616; Brown testimony, 11/10/99, at 59-61.

FN83. MDEQ July 1997, Proposed Plan Fact Sheet, 12th Street Landfill, at 4, Tr. Ex. 8616; Brown testimony, 8/11/98, at 131-32; Technical Memorandum 8, at 4-6 and Table 3-8. Tr. Ex. 8615.

<u>FN84.</u> Cornelius dep., 9/8/97, at 30-33, 119-128; Lawton dep. at 63-72; 1989 letter re PCB testing of landfill, Tr. Ex. 8611; Technical Memorandum 8, at 3-12 to 3-13, 6-1 to 6-2, Table 3-8 Tr. Ex. 8615; MDEQ July 1997 Proposed Plan Fact Sheet, Tr. Ex. 8616; Brown testimony, 8/11/98, at 132.

FN85. Cornelius dep., 10/12/99, at 49-51.

### D. James River Paper Company

James River Corporation and its predecessors (KVP Sutherland and Brown Company) have operated two paper-making facilities along the Kalamazoo River since 1939. One is the Specialty Papers Division

located in Parchment, Michigan ("Parchment Facility"), and the second is a box board manufacturing plant in Kalamazoo ("Kalamazoo Mill"). The Kalamazoo Mill also operated a deinking facility for a period of years during the 1970s. [FN86]

<u>FN86.</u> Ferguson dep. at 14-16; Nitz dep. at 38-39.

From 1939 through the mid 1970s, all effluent from Mill No. 1 operations at the Parchment Facility was discharged directly to the Kalamazoo River after passing through a series of settling lagoons. A clarifier and sludge dewatering system was implemented at Parchment Mill No. 2 in the mid to late 1970s. [FN87] Prior to the late 1960s, treated wastewater from the Kalamazoo Facility was discharged to the Kalamazoo River. [FN88]

<u>FN87.</u> James River June 9, 1972 interoffice correspondence, Tr. Ex. 8000; Ferguson dep. at 18.

FN88. Zinkus dep. at 19.

The Kalamazoo Mill box board manufacturing plant used pulp made of 100% recycled waste paper as furnish in its operations. [FN89] PCBs were detected in nearly every sample taken of James River's box board during the early 1970s to mid-1970s. [FN90]

<u>FN89.</u> Ferguson dep. at 14-16.

FN90. Huisman dep. at 21-22; Nitz dep. at 30-33; James River letter of 10/19/81 re PCB Data, Tr. Ex. 8022.

The pulp mill used primarily office waste paper as furnish for its operations. <u>[FN91]</u> On at least two particular days, 100% of the furnish for James River's pulp mill was NCR paper.<u>[FN92]</u>

FN91. Nitz dep. at 38-39.

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<u>FN92.</u> 1976 lab reports re PCBs in Brown Company effluent, Tr. Ex. 8007, at KJ 01000022.

In 1976, James River conducted a study to determine PCB concentrations in samples of white and colored ledger waste paper used as furnish in its deinking All of the samples taken contained PCBs, some with PCB levels as high as 6549.5 ppm, 9605.9 ppm, 6025.4 ppm, and 11,312.7 ppm. [FN93] In 1976 PCBs were detected in James River's vacuum filter solids at levels ranging between 12.7 and 125.7 ppm. [FN94] Vacuum filter solids are the paper residuals or sludge that was sent to the landfill. [FN95] On March 13, 1977, the vacuum filter solids had PCB levels of 180.6 ppm. [FN96] As Frank Yankoviak, James River's Technical Director, stated in a memorandum describing \*834 the study of furnish for the mills: "These results indicate that there is a considerable amount of PCB's coming in through our waste paper furnish." [FN97]

FN93. Brown Company memoranda of June 14 and June 21, 1976, Trial Exs. 8012 & 8013.

FN94. Brown Company August 1976 lab report, Tr. Ex. 8015. See also Brown Company September 1976 lab report, Tr. Ex. 8016.

FN95. Huisman dep. at 99-101, 122-24.

<u>FN96.</u> Brown Company 4/7/77 inter-office correspondence and lab report, Tr. Ex. 8018.

<u>FN97.</u> Brown Company 6/21/76 inter-office correspondence, Tr. Ex. 8013.

The paper residuals from both the Kalamazoo Mill and the Parchment Mill were deposited in James River's landfill at the Parchment Mill located near the Kalamazoo River. In 1987, the MDNR detected PCBs in soil/sludge samples from James River's landfill. [FN98] PCBs were detected in the pulp generated at James River's deinking mill at levels ranging from a trace up to 110 ppm. [FN99]

<u>FN98.</u> MDNR 8/18/87 letter to James River re PCB sampling data, Tr. Ex. 8023.

<u>FN99.</u> April 2, 1976 lab report on PCB sample, Tr. Ex. 8009; Huisman dep. at 53-67, 43-49, 102-106.

A reasonable inference can be made that PCBs were attached to the suspended solids in the effluent that the paper mills discharged to the Kalamazoo River. James River's comparison of PCB levels in clarifier influent, effluent and paper residuals (vacuum filter solids) from the James River clarifier prompted a James River employee to note that the concentration of PCBs generally follows the trend of suspended solids in the effluent: the higher the suspended solids, the higher the PCBs. [FN100]

FN100. Barrick testimony, 8/14/98, at 118-21; Brown Company lab reports, comparing PCB levels in clarifier influent, effluent and paper residuals/vacuum filter solids, Tr. Exs. 8008, 8015, & 8016; Brown Company Inter-Office Correspondence of 2/17/76 re PCB testing of effluent, Tr. Ex. 8008.

## E. Total contributed by Plaintiff's members

An expert retained by Georgia-Pacific Corporation, Richard B. Valley, prepared a report in 1990, estimating amounts of PCBs discharged by the paper mills during the period from 1960 to 1979. Mr. Valley estimated that Allied discharged between 895,000 and 1,790,000 pounds of PCBs; Georgia-Pacific discharged between 560,000 and 1,120,000 pounds of PCBs; James River discharged between 512,000 and 1,025,000 pounds of PCBs; and Simpson discharged between 254,000 and 507,000 pounds of PCBs. [FN101] According to Mr. Valley, 90% of the PCBs entering the mills went out in the effluent. [FN102]

FN101. Valley Report, Appendix A, at i-ii, Tr. Ex. 8804.

FN102. Id. at i.

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Not all of those quantities are at issue in this allocation action. The focus of this action is only on those PCBs in the relevant portions of the Kalamazoo River and Portage Creek. In 1997 the MDEQ estimated that approximately 350,000 pounds of PCBs are present at the NPL Site. [FN103] In the spring of 1998 Dr. Brown calculated the volume of PCBs in the river to be approximately 120,000 pounds in the riverbed from Portage Creek downstream. [FN104] He acknowledged, however, that taking into account the roughness of the estimate, the range of volume of PCBs could be from 60,000 to perhaps 240,000 pounds. <u>[FN105]</u> Dr. Brown's estimate does not include the PCBs in KRSG members' landfills and historical lagoons, many of which are a continuing source of new PCBs to the river and creek. [FN106] Dr. Brown has conceded that Plaintiff's PCB-containing residuals in the operable units, some of which continue to erode and leak into the river today, exceed one million cubic yards, and are "probably a little less than" three million cubic yards. [FN107]

<u>FN103.</u> March 1997 MDEQ Briefing Report prepared by Scott Cornelius, Tr. Ex. 8810.

<u>FN104.</u> Brown testimony, 8/11/98, at 106-07.

FN105. Id. at 107-08.

FN106. Id. at 108-109.

FN107. Id. at 109.

\*835 The evidence is uncontradicted that Plaintiff's members deinked or recycled large quantities of NCR carbonless copy paper, and that as a result of that activity PCBs entered their waste streams. Based upon the presence of high concentrations of PCBs in all of Plaintiff's members' landfills, lagoons, clarifiers, and Plaintiff's members' practice of discharging effluents with suspended solids directly to the Kalamazoo River, this Court concludes that PCBs were present in Plaintiff's members' effluent to the Kalamazoo River. This Court also concludes that this history, together with the current volume of PCBs in the river, and the ongoing erosion of PCBs from the landfills located on the edge of the river,

supports the conclusion Plaintiff's members contributed massive amounts of PCBs to the NPL Site, the Kalamazoo River and Portage Creek. Based upon the limited evidence presented, this Court cannot begin to arrive at a precise figure regarding the volume of PCBs contributed by KRSG members that are still in the river. Nevertheless, based upon the Valley Report, the MDNR estimates, and Plaintiff's failure to present any evidence on the quantity of its members' PCB contributions to the river, the Court concludes that Plaintiffs' members are responsible for hundreds of thousands of pounds of PCBs in the river.

### VIII. Evidence from the Fish

Plaintiff seeks a finding that because the Aroclor 1254 bioaccumulation rate in fish is three to four times greater than the bioaccumulation rate of Aroclor 1242, and because PCBs in fish are driving the investigation and clean- up at the Site, Rockwell's PCB releases are more toxic than plaintiff's release by a factor of between three and four.

Since 1977 the Michigan Department of Community Health has placed a fish advisory/ban on portions of Portage Creek and the Kalamazoo River, due to elevated levels of PCBs in fish. [FN108] Dr. Brown testified that roughly half the PCBs in the Kalamazoo River fish along the main stem are associated with or derived from Aroclor 1254. He contends that this figure contrasts dramatically to fish collected from Bryant Mill Pond, which, in his opinion, reflects what the fish would look like if only the paper industry had discharged PCBs to the system. [FN109]

FN108. EPA May 28, 1998 memorandum, at 4-5, Tr. Ex. 8813. In 1998 the U.S. Department of Interior's Fish and Wildlife Service reported that bald eagles who prey on the fish in the river had not been able to reproduce successfully for at least the past seven years. A bald eagle egg collected in 1994 contained PCBs at 102 ppm. EPA Action Memorandum and Addendum to Action Memorandum, April 17, 1998, p. 10 and May 28, 1998, at 4, Trial Ex. 8812 & 8813.

<u>FN109</u>. Brown testimony, 11/9/99, at 41-42.

Yet, on cross-examination, Dr. Brown testified that

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there are components in fish in Bryant Mill pond that come from 1254 and 1260. [FN110] He also conceded that there was a highly variable ratio of Aroclors 1242 and 1254 in the fish from Bryant Mill Pond. [FN111] He acknowledged that there is a toxic contribution of both lighter and heavier Aroclors all along the river, both upstream and downstream of Rockwell. [FN112] In fact, he stated that there is no significant difference in the relative amounts of lighter and heavier Aroclors from Kalamazoo to Lake Allegan. [FN113] Aroclor 1254 is found in the fish in Morrow Lake which is upstream of Rockwell. [FN114]

FN110. Id. at 75.

FN111. Id. at 75.

FN112. Id. at 76.

FN113. Id.

<u>FN114</u>. *Id*. at 77.

According to Mr. Barrick, fish studies do not indicate any additional bioaccumulation of 1254 in the area of Rockwell. [FN115] Dr. \*836 Brown agreed that the fish data support the conclusion that there is no real change in the PCB fingerprint along the Kalamazoo River. [FN116] The fish data also does not provide any evidence of a discernible source of PCBs downstream of the confluence of Portage Creek and the Kalamazoo River. [FN117]

<u>FN115.</u> Barrick testimony, 11/10/99, at 83-86; Ratio of PCB components in carp fillet, Tr. Ex. 5643; Ratio of PCB components in whole sucker, Tr. Ex. 5644.

<u>FN116.</u> Brown testimony, 11/9/99, at 82.

FN117. Id. at 77-78, 82.

Because there is no evidence of elevated levels of PCBs in the fish downstream of Rockwell, the fish do

not provide evidence that Rockwell contributed significant or measurable amounts of PCBs to the river.

Plaintiff nevertheless relies on evidence that more highly chlorinated PCB mixtures (those with higher molecular weights) are more carcinogenic than lower chlorinated PCB mixtures. Moreover, higher molecular weight PCBs bioaccumulate in fish in quantitatively higher levels than lower molecular weight PCBs. Given exposure to equal amounts of Aroclors 1242 and 1254, fish bioaccumulate three to four times more of Aroclor 1254 than Aroclor 1242. PCB levels in fish are one of the driving forces in determining the need for environmental responses in the Kalamazoo River and other aquatic PCB sites. This is because PCBs may be introduced into the food chain when fish are consumed by animals, and, Plaintiff contends that potentially, by humans. because Aroclor 1254 is more toxic than 1242, a smaller contribution of Aroclor 1254 should be weighted more heavily than an equal contribution of Aroclor 1242.

On the other hand, there is also evidence in the record that Aroclor 1242 contains a particularly toxic congener, known as Congener 77. That congener makes up a greater percentage of 1242 than it does of 1254 (in which it is also found, but in smaller amounts). [FN118]

FN118. Id. at 70-71.

The MDEQ establishes regulatory criteria and fish advisories based upon the presence of total PCBs. It does not distinguish between Aroclors, such as Aroclor 1242, Aroclor 1254, and Aroclor 1260. [FN119] The regulatory bodies have apparently decided that because toxic congeners are found in each of the Aroclors, there was no basis for distinguishing among the Aroclors. [FN120] No evidence was presented on the relative toxicity between the higher weight 1254 and the concerns associated with Congener 77 which are more prevalent in Aroclor 1242, leaving this Court without the ability to weigh these two competing toxicity factors. Accordingly, this Court will follow the regulatory bodies, and will treat all PCBs on an equal The Court will not weigh any particular basis. Aroclors higher than others.

FN119. Barrick testimony, 11/10/99, at 87-

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88; Brown testimony, 11/9/99, at 73.

FN120. Barrick testimony, 11/10/99, at 88.

### IX. Evidence of PCBs in the River

Notwithstanding the overwhelming evidence of Plaintiff's members' contribution of large quantities of PCBs to the river, or perhaps because of that evidence, Plaintiff has attempted to shift this Court's focus from Aroclor 1242 to Aroclor 1254 and from the entire ninety-five mile length of the Kalamazoo River at issue in this case to Lake Allegan, at the most downstream end of the Site.

Plaintiff contends that its members contributed only very minor amounts of Aroclor 1254 to the river. In support of this contention Plaintiff directs the Court's attention to the Aroclor 1242/1254 ratio in the controlled environment of Bryant Mill Pond, where the predominant source was one of Plaintiff's paper mill members. The ratio of Aroclor 1242 to 1254 in Bryant Mill Pond is more than 20 to 1, while the ratio of Aroclor 1242 to 1254 in the sediments in the Kalamazoo River is much lower, between 4 to 1 and 6 to 1.

Because there is no evidence to show that Allied is typical of all of KRSG's \*837 members, the Court is reluctant to accept Dr. Brown's assertion that the PCB levels in Bryant Mill Pond is typical of the PCB discharges of all four paper companies.

Moreover, although Plaintiff asserts that its members contributed only minor amounts of Aroclor 1254 to the river, Plaintiff has offered the Court no evidence to enable the Court to determine the nature or extent of its members' release of Aroclor 1254. There is no question that Plaintiff's members contributed some quantities of Aroclor 1254 to the river as Aroclor 1254 was found in each of the Plaintiff's members' landfills, lagoons and/or clarifiers. [FN121]

FN121. Allied: Draft Technical Memorandum 7, Table 3-10, Tr. Ex. 8719; Technical Memorandum 15, Table 3-2, Tr. Ex. 8715; Brown testimony, 8/11/98, at 120-21; Cornelius dep., 9/8/97, at 84-86; Georgia-Pacific: Technical Memorandum 9, Table 3-11, Tr. Ex. 8738; Brown testimony, 8/11/98, at 130-33; Technical Memorandum 6, Table 3-9, Tr. Ex. 8725; Simpson-

Plainwell: Cornelius dep., 9/8/97, at 123-25; Brown testimony, 8/11/98, at 132; Technical Memorandum 8, at 3-12--3-13 & Table 3-8, Tr. Ex. 8615; James River: MDNR 8/18/87 letter to James River re PCB sampling results, Tr. Ex. 8023.

Even if Plaintiff's comparison of the Aroclor 1242/1254 ratio in Bryant Mill Pond to the 1242/1254 ratio in the river might suggest releases of Aroclor 1254 by entities other than the KRSG members, it does not suggest any contribution of 1254 by Rockwell. There are other sources of Aroclor 1254 to the river, including plaintiff's member mills, the Auto Ion site upstream of Rockwell, the Publicly-Owned Treatment Works for the cities of Allegan, Otsego, Plainwell and Kalamazoo, upstream of Rockwell, as well as existing background levels of 1254. [FN122] It is well established that the ratio of Aroclor 1242 to 1254 in the river sediments upstream and downstream of Rockwell are approximately the same. If Rockwell had released significant quantities of PCBs to the river, those PCBs would have increased the ratio of Aroclor 1254 to Aroclor 1242. Sediment samples from the length of the river evidenced no increase in concentration of 1254 below the Rockwell facility. [FN123] In fact, the highest concentrations of 1254 are upstream of the Rockwell facility. [FN124] In sediment samples taken upstream of Rockwell and downstream of Rockwell, a comparison of the gas chromatographic "fingerprints" indicates that the ratio of Aroclor 1242 to Aroclor 1254 is relatively constant, averaging between four and six parts Aroclor 1242 to one part Aroclor 1254 (4:1 to 6:1), indicating again that there was no measurable, independent release of PCBs from the Rockwell plant. [FN125]

<u>FN122.</u> Brown testimony, 11/9/99, at 58-61, 62-64, 64-69, 76.

FN123. See Comparison of the ratios of Aroclor 1242:1254 concentrations in Kalamazoo River and Portage Creek, Tr. Ex. 5637; Comparison of Aroclors 1242:1254 ratios in Portage Creek and other locations downstream to Lake Allegan Dam, Tr. Ex. 5638.

<u>FN124.</u> Barrick testimony, 11/10/99, at 76;

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Comparison of the ratios of Aroclor 1242:1254 concentrations in Kalamazoo River and Portage Creek, Ex. 5637.

FN125. Barrick testimony, 11/10/99, at 70-71; Barrick testimony, 8/14/98, at 105-110; Illustrative charts comparing PCB fingerprints, Tr. Exs. 8919, 8920, & 8927.

If the only evidence before the Court were the gas chromatographs, the Court might find that that evidence, standing alone, was not sufficiently precise to reflect small, but still significant contributions to the river. The gas chromatographs, however, do not stand alone. They are confirmed by the other evidence in this case. As noted above, the evidence from the Rockwell plant, tends to show a very small contribution of PCBs. The minimal nature of Rockwell's PCB contribution is also confirmed by 300 samples of river sediment taken from between the Rockwell plant and Lake Allegan.

At the conclusion of the Phase I trial, this Court opined that there was insufficient evidence of sampling from depositional areas where PCBs from Rockwell's oils would be expected to have come to \*838 rest, to support Mr. Barrick's conclusion that Rockwell's introduction of Aroclor 1254 to the river had no impact. After the Phase I trial Rockwell arranged for further examination of the river environment by a geologist, a geomorphologist, and Mr. Barrick. Depositional areas of the river in which oils would be expected to accumulate downstream of Rockwell were identified. Mr. Barrick then conducted sampling in these depositional areas. [FN126]

FN126. Barrick testimony, 11/10/99, at 33-36; Aerial photo showing probable depositional areas below Rockwell Facility, Tr. Ex. 5633.

Mr. Barrick analyzed 300 river sediment samples between Rockwell and Lake Allegan. [FN127] Very few of the 300 samples collected downstream of Rockwell had elevated levels of 1254; the highest absolute concentrations of Aroclor 1254 are *upstream* of Rockwell; and there was no increase in absolute concentrations of Aroclor 1254 at or near Rockwell. [FN128] In addition, Mr. Barrick's analysis showed no correlation between the observable presence of oil

and concentrations of Aroclor 1254. Higher concentrations of Aroclor 1254 were found in the samples having the *least* petroleum odor, tending to show that the Aroclor 1254 in these sediments came from non-petroleum sources upstream of Rockwell. [FN129]

<u>FN127.</u> Barrick testimony, 11/10/99, at 29-32.

FN128. Barrick testimony, 11/10/99, at 78.

<u>FN129</u>. *Id.* at 52-54; Odor and/or sheen presence compared with PCB concentration in samples at different depths in sediment core RR-11, Tr. Ex. 5641.

In one area 1.7 miles downstream of Rockwell, one core, BR-27, showed elevated levels of 1254: Aroclor 1254 increased from the surface at concentrations of 190 ppb to a location 2 1/2 to 3 feet below the surface where the concentrations increased to 10 ppm, and then below that they decreased.

Plaintiff contends that BR-27 and elevated Aroclor 1254 detections in at least a half dozen sediment samples within 1.7 river miles of Rockwell's Allegan facility [FN130] confirm that Rockwell's PCB discharges made a significant contribution to the PCBs currently in river sediments.

FN130. Between the Rockwell facility and BR-27, there were also samples with concentrations of Aroclor 1254 at levels of 4.7 ppm, 6.2 ppm, 4.5 ppm. Brown testimony, 11/10/99, at 142-46.

According to Mr. Barrick, the sample at BR-27 was an anomaly. What makes BR- 27 unique is not just the amount of 1254, but the high ratio of 1254 to 1242. [FN131] Its fingerprint was unlike any other samples upstream or downstream. [FN132] Barrick attributes the "anomalous" BR-27 sample to some unknown local source or dumping in that area. [FN133]

FN131. Barrick testimony, 11/10/99 at 74.

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FN132. Id. at 75.

FN133. Id. at 75-76.

The additional sampling and analysis conducted by Rockwell's consultant more than adequately addresses the Court's previous concern about the representative nature of the sampling. The Court concludes that the sampling of the river and the analysis by Mr. Barrick reflect sound scientific methodology and yield reliable results. This Court is satisfied that BR-27 does not confirm a significant contribution of Aroclor 1254 by Rockwell. Rockwell had been a significant course of 1254 to the river, there would be a number of findings like those at BR-27, showing an elevated ratio of 1254 to 1242. It is implausible that a discharge from Rockwell would be reflected in only one sample location (BR-27), while no evidence of such a discharge is seen in any of the other 299 sediment samples between Rockwell and Lake Allegan.

The absence of an increase in 1254 downstream of Rockwell constitutes credible and persuasive evidence that the former Rockwell Allegan facility is, at best, \*839 an inconsequential source of PCBs to the Kalamazoo River.

By contrast, the PCB contribution by Plaintiff's members is very large. Plaintiff has admitted that its members are responsible for most of the Aroclor 1242 in the river. Assuming Plaintiff is responsible for all of the 1242 and none of the 1254, and assuming the accuracy of the MDEQ's estimate that there are 350,000 pounds of PCBs in the river sediments, at a 4:1 ratio of 1242 to 1254, Plaintiff's members would be responsible for 280,000 pounds of PCBs. At a 6:1 ratio, Plaintiff's members would be responsible for 300,000 pounds.

### VI. Cooperation

The final Gore factor the parties contend is significant to the Court's analysis in this allocation action is "the degree of cooperation by the parties with Federal, State, or local officials to prevent any harm to the public health or the environment." See Mever, 932 F.2d at 571.

As evidence of Rockwell's recalcitrance, Plaintiff focuses on evidence that Rockwell historically engaged in improper oil disposal practices, and evidence that Rockwell and the EPA have had disagreements over the Rockwell Superfund Site, to the extent that the EPA has retaken control over the Rockwell Superfund Site for purposes of conducting the remedial investigation.

The Court does not find that the evidence of Rockwell's historical disposal practices is of much significance in this action. The paper companies had similar histories of discharging suspended solids directly to the Kalamazoo River in excess of their MWRC permits. Historical discharge practices is not a factor that that weighs against one party more than another.

There is also no evidence that Rockwell has refused to cooperate with the MDNR or the EPA on the site at issue in this case, as Rockwell has not been named a PRP. As to the disagreements between Rockwell and the EPA over the Rockwell Superfund Site, the Court finds that such disagreement has little relevance to this action. PCBs are not the focus of that action. To the extent the issue of PCBs has come up in connection with Rockwell's own Superfund Site, the issue is minuscule compared with the continued release of PCBs from Plaintiff's members' OUs where the level of PCBs is higher and the continued release of PCBs is well documented and continuing.

Finally, the Court notes that in June 1999 the MDEQ advised that the data submitted by KRSG was insufficient to develop an appropriate understanding of contaminant distribution across the study area. [FN134] The MDEQ expressed concern that KRSG's sampling techniques may have introduced a bias into the results by sampling more in free-flowing reaches of the river where PCB concentrations are low, and less in impounded areas where PCB concentrations are higher. The MDEQ stated that it currently did not have "sufficient information regarding sediment volume and PCB mass from the site to develop appropriate remedial options." [FN135]

FN134. June 11, 1999 letter from Scott Cornelius of the Superfund Section of MDEQ's Environmental Response Division to Dr. Brown, Tr. Ex. 5507.

FN135. Id.

Dr. Brown testified in November 1999 that the

(Cite as: 107 F.Supp.2d 817)

additional work requested by the MDEQ was scheduled to begin the following week. [FN136] Earlier, Dr. Brown testified that he had been instructed by KRSG not to calculate the amount of PCBs in the Kalamazoo River on a mass basis and not to calculate the mass contributions of PCBs by any of KRSG's members. [FN137] It appears to this Court that KRSG has avoided or delayed undertaking a thorough analysis of its own contribution of PCBs as part of its strategy in this suit of minimizing \*840 the extent of its members' PCB contributions.

FN136. Brown testimony, 11/9/99, at 50.

FN137. Brown testimony, 8/11/98, at 104-05

Because the Court finds a lack of full cooperation by both parties, the Court concludes that the cooperation factor does not weigh in favor of one party more than another.

### Conclusion

[4] In resolving Plaintiff's contribution claim against Rockwell, the Court may allocate response costs using such equitable factors as the court determines are appropriate. 42 U.S.C. § 9613(f). In this action the Court finds that the most important Gore factor is the quantity of PCBs released.

The Court recognizes that this case presents the not uncommon situation where companies have disposed of waste without knowing its contents. See <u>B.F. Goodrich</u>, 99 F.3d at 526. This is true of the KRSG members as well as Defendant Rockwell. In such cases, because the parties lack direct evidence of the fact that others have dumped hazardous wastes, or of the amount of hazardous wastes that were dumped, the Court must rely on circumstantial evidence in order to accomplish the broad, remedial purpose of CERCLA. <u>Id.</u>

Although Plaintiff is not required to prove its case with direct evidence or with mathematical precision, it still has the burden of proving its equitable right to contribution by a preponderance of the evidence. <u>Id.</u>

Because this Court has determined that quantity is the most important allocation factor in this case, the allocation analysis must begin with an estimate of the quantity of hazardous wastes at issue, and then proceed to a determination of the parties' relative contributions to that total amount.

Plaintiff has produced almost no evidence to enable the Court to begin its analysis. The figures Plaintiff has provided are not consistent or helpful. The Court is left with little to begin with beyond the undisputed fact that the recycling and deinking of office paper, which included carbonless copy paper from the mid-1950s to the mid-1970s, is the major cause of PCB contamination at the Site. Plaintiff's landfills are a continuing source of PCBs to the river. The PCB concentration in those landfills frequently exceeds 100 ppm. Based upon the varied estimates presented and Plaintiff's failure to present any evidence contradicting or clarifying the rough estimates, the Court concludes that KRSG's members are responsible for releasing hundreds of thousands of pounds of PCBs to the Site.

Balanced against Plaintiff's members' overwhelming contribution of PCBs, is the evidence regarding Rockwell's contribution. For all the detail Plaintiff has presented on Rockwell's historical release of oils to the river, Plaintiff has presented little credible evidence on the quantity of PCBs contained in that oil. Given the low levels of PCBs on the Rockwell property, and the fact that the river sediments and the fish tend to show no significant contribution by Rockwell, the Court finds that Rockwell's PCB contribution was very minimal, particularly in contrast to the contribution by Plaintiff's members. Rockwell's PCB contribution did not exceed background levels and would not in itself have resulted in a need for remediation of the Kalamazoo River.

Having considered the equities in this case, the Court concludes that Rockwell should not be required to contribute to the remediation of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. The PCB releases by Plaintiff's members are more than sufficient to justify imposing on Plaintiff the entire cost of response activities relating to the NPL Site.

107 F.Supp.2d 817, 51 ERC 1396

**END OF DOCUMENT** 

United States Court of Appeals, Sixth Circuit.

KALAMAZOO RIVER STUDY GROUP, Plaintiff-Appellant,

٧.

ROCKWELL INTERNATIONAL CORPORATION, Defendant-Appellee.

No. 00-1774.

Argued Oct. 24, 2001. Decided and Filed Dec. 18, 2001.

Association of paper companies sued manufacturer automobile parts under Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and Michigan Natural Resources and Environmental Protection Act (NREPA), seeking contribution for response costs incurred in responding to releases of polychlorinated biphenyls (PCBs) into river. Following bench trial, the United States District Court for the Western District of Michigan, Robert Holmes Bell, Chief District Judge, entered judgment against plant owner as to liability only, but ultimately declined to allocate response costs to manufacturer, 107 F.Supp.2d 817. Association appealed. The Court of Appeals, Gilman, Circuit Judge, held that district court's decision not to allocate response costs to manufacturer, which it found to be responsible for less than one-tenth of one percent of PCBs in river, was not an abuse of discretion.

Affirmed.

Nathaniel R. Jones, Circuit Judge, concurred and filed opinion.

West Headnotes

#### 11 Federal Courts 813 170Bk813 Most Cited Cases

District court's allocation of response costs in a CERCLA contribution action will not be set aside unless Court of Appeals determines that the district court abused its discretion. Comprehensive Environmental Response, Compensation, and Liability Act of 1980, § 101 et seq., as amended, 42 U.S.C.A. § 9601 et seq.

#### [2] Federal Courts 812 170Bk812 Most Cited Cases

An abuse of discretion is found where Court of Appeals is left with the definite and firm conviction that the district court committed a clear error of judgment.

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#### [3] Federal Courts 655.1 170Bk855.1 Most Cited Cases

Factual findings underlying a district court's allocation of response costs under CERCLA may be set aside only if clearly erroneous. Comprehensive Environmental Response, Compensation, and Liability Act of 1980, § 101 et seq., as amended, 42 U.S.C.A. § 9601 et seq.

#### 14] Federal Courts 853 170Bk853 Most Cited Cases

A factual finding is clearly erroneous where, although there is evidence to support that finding, the reviewing court on the entire evidence is left with the definite and firm conviction that a mistake has been committed.

## [5] Environmental Law 447

149Ek447 Most Cited Cases

(Formerly 199k25.5(5.5) Health and Environment)

District court did not abuse its discretion under CERCLA by declining to allocate portion of response costs for cleanup of polychlorinated biphenyls (PCBs) in river to automobile parts manufacturer, even though court had initially determined during first stage of bifurcated trial, while applying a sincerejected standard of liability, that manufacturer had released a sufficient amount of PCBs to be held liable for response costs; finding in first stage did not obligate court to allocate response costs to manufacturer, which was responsible for less than one-tenth of one percent of PCBs in river. Comprehensive Environmental Response, Compensation, and Liability Act of 1980, § 101 et seq., as amended, 42 U.S.C.A. § 9601 et seq.

## [6] Environmental Law 6-447

149Ek447 Most Cited Cases

(Formerly 199k25.5(5.5) Health and Environment)

A defendant cannot always avoid paying response

costs under CERCLA where its release does not significantly affect clean-up costs; for example, if all of the responsible parties have each released only a relatively small amount of hazardous material, then each individual release in isolation would have little impact on the total cost of cleaning up a contaminated site, but a court could nevertheless reasonably allocate a portion of the response costs to each party. Comprehensive Environmental Response, Compensation, and Liability Act of 1980, § 101 et seq., as amended, 42 U.S.C.A. § 9601 et seq.

#### 17] Environmental Law 447 149Ek447 Most Cited Cases (Formerly 96k5(6.1))

A liability determination is just the first element of a contribution claim under CERCLA. Comprehensive Environmental Response, Compensation, and Liability Act of 1980, § \$ 107(a), 113(f), as amended, 42 U.S.C.A. § \$ 9607(a), 9613(f).

### [8] Environmental Law 437

149Ek437 Most Cited Cases

(Formerly 199k25.5(5.5) Health and Environment)

## [8] Environmental Law 447

149Ek447 Most Cited Cases

(Formerly 199k25.5(5.5) Health and Environment)

Recovery of response costs by a private party under CERCLA is a two-step process: plaintiff initially must prove that a defendant is liable under CERCLA, and once that is accomplished, the defendant's share of liability is apportioned in an equitable manner. Comprehensive Environmental Response, Compensation, and Liability Act of 1980, § § 107(a), 113(f), as amended, 42 U.S.C.A. § § 9607(a), 9613(f).

## [9] Environmental Law 🗪 447

149Ek447 Most Cited Cases

(Formerly 199k25.5(5.5) Health and Environment)

District court has broad discretion to allocate response costs under CERCLA, and in making this allocation it is authorized to consider any equitable factors it considers appropriate. Comprehensive Environmental Response, Compensation, and Liability Act of 1980, § 101 et seq., as amended, 42

U.S.C.A. § 9601 et seq.

## [10] Environmental Law 447

149Ek447 Most Cited Cases

(Formerly 199k25.5(5.5) Health and Environment)

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Determination by district court that automobile parts manufacturer had released an inconsequential amount of polychlorinated biphenyls (PCBs) into river in comparison with amount of PCBs released by other responsible parties, which provided basis for its decision not to allocate response costs to manufacturer under CERCLA, was not clearly erroneous; expert in environmental chemistry estimated, based on analysis of both estimated amount of oil manufacturer had discharged, and concentration of PCBs in those oils, that manufacturer had likely released less than 20 pounds of PCBs into river. Comprehensive Environmental Response, Compensation, and Liability Act of 1980, § 101 et seg., as amended, 42 U.S.C.A. § 9601 et seq.

#### 111 Environmental Law 447 149Ek447 Most Cited Cases (Formerly 96k7)

Determination by district court that factors concerning relative toxicities of polychlorinated biphenyls (PCBs) that had been released into river by parties to CERCLA contribution action, and cooperation of parties with regulatory authorities, did not favor any particular allocation of response costs, which served in part as its basis for decision not to allocate response costs to automobile parts manufacturer it found to have released an inconsequential amount of PCBs, was not clearly erroneous. Comprehensive Environmental Response, Compensation, and Liability Act of 1980, § 101 et seq., as amended, 42 U.S.C.A. § 9601 et seq.

\*1045 Alan C. Bennett (briefed), Law, Weathers & Richardson, Grand Rapids, MI, Jerome T. Wolf (argued and briefed), James L. Moeller (briefed), Amy E. Bauman (briefed), David S. Ladwig (briefed), Sonnenschein Nath & Rosenthal, Kansas City, MO, for Plaintiff-Appellant.

<u>Kathryn J. Humphrey</u> (briefed), <u>Joseph C. Basta</u> (argued), Dykema Gossett, Detroit, MI, for Defendant-Appellee

Before: JONES, MOORE, and GILMAN, Circuit

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(Cite as: 274 F.3d 1043)

Judges.

GILMAN, J., delivered the opinion of the court, in which MOORE, J., joined. NATHANIEL R. JONES, J. (pp. 1052-53), delivered a separate concurring opinion.

#### **OPINION**

GILMAN, Circuit Judge.

The Kalamazoo River Study Group (KRSG), an unincorporated association of paper manufacturers, brought suit in federal district court pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), 42 U.S.C. § § 9601-75, seeking contribution from Rockwell International Corporation for the latter's role in contaminating the Kalamazoo River with polychlorinated biphenyls (PCBs). In a bifurcated bench trial, the district court first determined that Rockwell's release of PCBs into the Kalamazoo River was significant enough for it to face liability under CERCLA. But the district court ultimately declined to allocate any response costs to Rockwell, finding that its release of PCBs was minuscule (less than onehundreth of 1%) in comparison with that of the companies comprising the KRSG. For the reasons set forth below, we AFFIRM the judgment of the district court.

#### I. BACKGROUND

This case arises from the presence of PCBs in a portion of the Kalamazoo River located in the state of Michigan. The substance is a synthetic liquid with many industrial uses. It is also a hazardous material that poses significant health and environmental risks. Because of these risks, the manufacture of PCBs ceased in the 1970s. At approximately the same time, the state agency now known as the Michigan Department of Environmental Quality (MDEQ) began studying the level of PCBs in the Kalamazoo River. The MDEQ completed its initial investigation in 1990, concluding that a 35 mile stretch of the River was contaminated with PCBs. This stretch begins at the confluence of the Kalamazoo River with Portage Creek, and continues downstream to the Allegan City Dam.

Based upon the findings of the MDEQ, the United States Environmental Protection Agency (EPA) placed this portion of the River, along with a threemile portion of Portage Creek, on the National Priorities List as a Superfund Site pursuant to § 105 of CERCLA (42 U.S.C. § 9605) (collectively, the Site). The EPA subsequently authorized the MDEQ to conduct an Endangerment/Risk Assessment (E/RA) of the Site. Following the E/RA, the MDEQ identified three paper mills as being \*1046 potentially responsible for the PCB contamination: Georgia Pacific Corporation, Millennium Holdings, Incorporated, and Plainwell, Incorporated. companies then entered into an Administrative Order by Consent (AOC) that required them to fund a Remedial Investigation and Feasibility Study (RI/FS) at the Site and its surrounding area. Fort James Operating Company later agreed to share the costs of the RI/FS, joining with the other companies to form the KRSG.

Pursuant to the AOC, the RI/FS encompassed a 95 mile stretch of the Kalamazoo River running both upstream and downstream from the Site. This expanded area included the portion of the River that is adjacent to the former site of Rockwell's manufacturing facility in Allegan, Michigan. From approximately 1910 to 1989, Rockwell built universal joints for the automotive industry at its Allegan facility.

In 1995, the KRSG brought suit against Rockwell and several other companies in the United States District Court for the Western District of Michigan. The KRSG alleged that these companies were partly responsible for contaminating the Site with PCBs. It therefore sought contribution from them for the costs associated with both the RI/FS and the future cleanup of the Site. Although the KRSG asserted various bases for its right to contribution, the district court and the parties focused exclusively on the KRSG's contribution claim pursuant to § 113(f) of CERCLA (42 U.S.C. § 9613(f)). The KRSG's contribution claims against the other companies subsequently settled or were otherwise resolved, leaving only its claim for contribution against Rockwell for resolution by the district court.

A procedural ruling by the district court bifurcated the trial of the KRSG's contribution claim against Rockwell into two stages, with the first limited to liability and the second focused on the allocation of response costs. Both stages were tried to the bench. At the liability stage, the district court employed a "threshold of significance" standard of liability, a standard later rejected by this court. As articulated by the district court, this standard imposed CERCLA liability where a defendant's release of hazardous

material is of sufficient significance to justify response costs Kalamazoo River Study Group v Menasha Corp., 228 F 3d 648, 654 (6th Cir 2000) (describing the threshold of significance standard) The district court determined that the KRSG and Rockwell had both released a sufficient amount of PCBs to face liability under the threshold of significance standard It observed, however, that Rockwell's release of PCBs appeared to be minimal in comparison to the release of PCBs by the members of the KRSG Although this court later rejected the threshold of significance standard because it improperly requires the plaintiff to show that a defendant's release of hazardous materials caused response costs, see id at 655, the adoption of a lower liability standard did not inure to the benefit of Rockwell The district court's finding that Rockwell had released a sufficient amount of PCBs to be held potentially liable even under the more onerous threshold of significance standard would obviously not change when subjected to the lower standard

Following the liability stage, the district court considered the proper allocation of response costs between the KRSG and Rockwell The district court identified three factors as generally relevant to the (1) the relative allocation of response costs quantities of PCBs released by the parties, (2) the relative toxicity of those PCBs, and (3) the cooperation of the parties with the regulatory authorities After the court found that the latter two factors did not favor any particular allocation of response costs, it focused on the relative quantity of PCBs released by Rockwell \*1047 versus the amount released by the KRSG The district court determined that Rockwell had likely released no more than 20 pounds of PCBs from its Allegan facility contrast, the court found that the members of the KRSG had released "hundreds of thousands of pounds" of PCBs into the River Based upon these findings, the district court did not allocate any response costs to Rockwell The KRSG now appeals the district court's decision

#### II. ANALYSIS

#### A. Standard of review

[1][2] A district court's allocation of response costs in a CERCLA contribution action will not be set aside unless we determine that the court abused its discretion <u>United States v R W Meyer, Inc.</u>, 932 F 2d 568, 573 (6th Cir 1991) An abuse of discretion is found where we are left with the "definite and firm conviction that the trial court committed a clear error of judgment " <u>Logan v Dayton Hudson Corp.</u>, 865

#### F 2d 789, 790 (6th Cir 1989)

[3][4] The factual findings underlying the district court's allocation of response costs may be set aside only if clearly erroneous <u>Schroyer v Frankel</u>, 197 F 3d 1170, 1173 (6th Cir 1999) A factual finding is clearly erroneous where, although there is evidence to support that finding, "the reviewing court on the entire evidence is left with the definite and firm conviction that a mistake has been committed "<u>United States v United States Gypsum Co</u>, 333 U S 364, 395, 68 S Ct 525, 92 L Ed 746 (1948)

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# B. The district court did not abuse its discretion in declining to allocate response costs to Rockwell

# 1. A holding of potential liability does not preclude a zero allocation of response costs

[5] The KRSG argues that the district court's refusal to allocate response costs to Rockwell is inconsistent with its earlier conclusion that Rockwell faced liability under CERLCA for releasing PCBs into the Kalamazoo River Specifically, the KRSG maintains that the district court cannot logically decline to allocate response costs to Rockwell after determining that it faced liability under the now-discredited threshold of significance standard. We disagree

At the allocation stage of the trial, the district court focused on the relative quantities of PCBs released into the Kalamazoo River by the parties But in determining that Rockwell faced liability under CERCLA, the district court did not make specific findings with regard to the amount of PCBs released by Rockwell versus the amount released by the KRSG The district court explicitly stated that, at the liability stage, it was "not called upon to quantify Rockwell's release of PCBs to the River " It instead focused on whether Rockwell's release of PCBs was "more than incidental or sporadic" The district court ultimately concluded that Rockwell faced liability under CERCLA after finding that Rockwell released PCBs in "measurable or detectable quantities" This finding did not obligate the district court to allocate response costs to Rockwell irrespective of the court's specific analysis of the relative amount of PCBs released by Rockwell versus the KRSG

The United States Court of Appeals for the Seventh Circuit faced this very issue in  $\underline{PMC}$ ,  $\underline{Inc}\ v\ Sherwin-Williams\ Co$ , 151 F 3d 610 (7th Cir 1998) In  $\underline{PMC}$ , the Seventh Circuit held that the district court did not abuse its discretion in declining to allocate response costs to a polluter who admitted to dumping toxic

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waste  $\underline{Id}$  at 616. The court explained that the polluter's "spills may have been too inconsequential to affect the cost of cleaning up significantly, and in that event a zero allocation to [the polluter] would be appropriate " \*1048 $\underline{Id}$  As in the case before us, the other polluter in  $\underline{PMC}$  was found responsible for substantially all of the total contamination of the site  $\underline{Id}$ 

Seeking to distinguish the <u>PMC</u> decision, the KRSG points out that the court in <u>PMC</u> used a standard that imposed liability no matter how small the release of hazardous material. A liability determination under this standard does not necessarily require an allocation of response costs, according to the KRSG, because liability may be imposed absent a finding of any significant release. Under the threshold of significance standard of liability mistakenly employed by the district court at the liability phase in the present case, however, the KRSG argues that a determination of liability necessarily means that the court found that the defendant had released a significant amount of hazardous material

The KRSG misses the mark, however, because the court in <u>PMC</u> was not concerned with whether the polluter had released a significant amount of hazardous material. Instead, the court looked to whether the polluter's release of hazardous material was too inconsequential in comparison to that of the other polluter to significantly affect clean-up costs <u>Id</u>. In other words, where the other responsible parties release vast quantities of hazardous material, a defendant's release of what, standing alone, would be a significant amount of such material might have no impact on the total cost of cleaning up a contaminated site

[6] This is not to say that a defendant can always avoid paving response costs where its release does not significantly affect clean-up costs example, all of the responsible parties have each released only a relatively small amount of hazardous material, then each individual release in isolation would have little impact on the total cost of cleaning up a contaminated site Nevertheless, a court faced with these circumstances could reasonably allocate a portion of the response costs to each party But this is not the situation in the present case. The district court concluded that the companies comprising the KRSG each released exponentially more PCBs into the Kalamazoo River than Rockwell, so that Rockwell's release will have essentially no effect on the as yet-undetermined clean-up costs

Even assuming that the district court's liability determination did not require an allocation of future clean-up costs to Rockwell, the KRSG argues that this determination should have at least led the district court to require Rockwell to pay for the some of the costs associated with the RI/FS. These costs, according to the KRSG, should be allocated to Rockwell even if it released a relatively small amount of PCBs into the River. Specifically, the KRSG argues that CERCLA authorizes the allocation of investigation costs to any party that created a reasonable risk of contaminating a site.

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In support of its argument, the KRSG cites Johnson v James Langley Operating Co., 226 F 3d 957, 964 (8th Cir 2000) (stating that a plaintiff may recover the costs associated with environmental testing or sampling "only if the party seeking to recover costs has an objectively reasonable belief that the defendant's release or threatened release of hazardous substances would contaminate his or her property"), and Lansford-Coaldale Joint Water Auth v Tonolli Corp., 4 F 3d 1209, 1219 (3d Cir 1993) (stating that CERCLA liability for environmental investigation costs requires, among other things, that "there was a reasonable risk (although one that may not materialize) that the defendant's release or threatened release of hazardous substances would contaminate the plaintiff's property")

\*1049 [7][8] Both Johnson and Lansford-Coaldale address the showing required to establish a party's liability for investigation costs in an action brought by a landowner pursuant to § 107(a) of CERCLA (42 USC § 9607(a)) A liability determination, however, is just the first element of a contribution claim under § 113(f) "Recovery of response costs by a private party under CERCLA is a two-step process Initially, a plaintiff must prove that a defendant is liable under CERCLA Once that is accomplished, the defendant's share of liability is apportioned in an equitable manner " Kalamazoo River Study Group v Menasha Corp., 228 F 3d 648, 656-57 (6th Cir 2000) (internal quotation marks and Neither Johnson nor Lansfordcitation omitted) Coaldale hold that a defendant who is subject to liability for investigation costs must necessarily be allocated a share of those costs in a contribution Accordingly, these cases provide no guidance as to the proper allocation of such costs in the present case

[9] The district court has broad discretion to allocate the costs associated with the RI/FS <u>Franklin County</u> Convention Facilities Auth v Am Premier

Underwriters, Inc., 240 F.3d 534, 549 (6th Cir.2001) ("The apportionment of CERCLA liability under § 113(f) among various responsible parties is an equitable undertaking within the broad discretion of the district court."). In allocating these costs, the district court is authorized to consider any "equitable factors" that it considered "appropriate." 42 U.S.C. § 9613(f). The district court's decision not to allocate any costs for the RI/FS to Rockwell was based upon its finding that the KRSG was responsible for more than 99.9% of the PCBs in the River. Although the KRSG challenges this finding, a challenge that we address in Part II.B.2. below, it fails to show that the district court abused its discretion in looking to the relative quantities of PCBs released by the parties in allocating costs for the RI/FS.

The KRSG further argues that the district court's failure to allocate response costs to Rockwell after finding that it had released PCBs into the Kalamazoo River defeats the central purpose of CERCLA; namely, the prompt clean-up of hazardous waste. According to the KRSG, the district court's allocation of response costs in this case encourages parties to litigate "in the hope of obtaining a zero share, rather than voluntarily joining in the investigation or But the allocation of response costs is settling." highly fact-intensive, so that an allocation of zero response costs in a particular case provides little incentive for defendants in other contribution actions to reject reasonable settlement offers or risk the uncertainties inherent in litigation.

For all of these reasons, we conclude that the district court's liability determination did not obligate it to allocate response costs to Rockwell.

# 2. The district court did not err in finding that Rockwell had released an inconsequential amount of PCBs in comparison to the amount of PCBs released by the members of the KRSG

[10] The relative quantities of PCBs released by the parties was the decisive factor in the district court's allocation of response costs. It found that Rockwell had likely released less than 20 pounds of PCBs into the Kalamazoo River. In contrast, the district court determined that the KRSG members had released several hundred thousand pounds of PCBs into the River. The KRSG concedes that its own members released massive amounts of PCBs, but maintains that the district court erred in concluding that Rockwell had released \*1050 such a small amount of the hazardous substance.

In assessing Rockwell's release of PCBs, the district court gave credence to the testimony of Robert Barrick, an expert in environmental chemistry. Barrick testified that he formed an opinion as to the amount of PCBs that Rockwell released into the Kalamazoo River by analyzing estimates of both the amount of oil that Rockwell had discharged and the concentration of PCBs in those oils. With regard to the amount of discharged oils, Barrick used the estimate offered by Dr. Kenneth Crumrine, the KRSG's expert. Barrick then estimated the concentration of PCBs in those oils by examining the oils remaining in the groundwater at the site of Rockwell's Allegan facility. He determined that these oils contained no more than 0.000035% PCB. Based upon his analysis of these two estimates, Barrick concluded that Rockwell had likely released less than 20 pounds of PCBs into the River.

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The KRSG challenges Barrick's opinion on several grounds. First, the KRSG contends that Barrick could not accurately estimate the amount of PCBs released by Rockwell without having the expertise to predict how the oils discharged from Rockwell's facility would have reacted once in the River. We find no merit in this argument, however, because the KRSG fails to explain why Barrick needed to possess such expertise in order to form a reliable opinion as to Rockwell's release of PCBs. The mathematical methodology employed by Barrick, as well as by Dr. Crumrine, requires an assessment of only the amount of discharged oil and the concentration of PCBs in This methodology requires no analysis of how PCBs travel or change in a river environment.

The KRSG further claims that Barrick had no basis for concluding that the concentration of PCBs in the oil discharged by Rockwell was the same as the concentration in the oil currently found in the groundwater at the site of the Allegan facility. But KRSG did not challenge Barrick's testimony on this ground at trial. Furthermore, Barrick testified that his analysis of the oil in the groundwater revealed very little evidence of any weathering or degradation, thus demonstrating that the PCB concentration of the oil in the groundwater was representative of the concentration in the oils discharged by Rockwell. The KRSG offered no evidence to refute this testimony.

Next, the KRSG maintains that the district court erred in declining to accept Dr. Crumrine's estimate of the PCB concentration in the oils discharged by Rockwell. Dr. Crumrine estimated that these oils contained either 5% or 50% PCB, depending on the

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(Cite as: 274 F.3d 1043)

particular type of oil. The district court reasonably rejected this estimate based upon Barrick's testimony that it is "physically impossible" for oils containing 5% or 50% PCB to be reduced to a PCB concentration of only 0.000035%, the concentration of the oil found in the groundwater at the site of the Allegan facility. In addition, the district court pointed out that Dr. Crumrine's estimate failed to take into account that, beginning in the early 1960s, Rockwell increasingly used water-soluble oils that might not have contained PCBs at all.

Finally, the KRSG argues that Barrick's opinion is rebutted by other evidence showing that Rockwell in fact released a large amount of PCBs into the River. The KRSG specifically relies upon a few sediment samples gathered from the River that contained elevated levels of Aroclor 1254, the type of PCB that Rockwell used at its Allegan facility. One such sample, identified as "BR 27," was recovered 1.7 miles from the Allegan facility and contained a very high level of Aroclor 1254. The KRSG contends that BR-27, as well \*1051 as six other sediment samples with high Aroclor 1254 levels, prove that Rockwell released a large amount of PCBs into the River.

In our view, the district court properly determined that these samples were of limited probative value. As the district court pointed out, Barrick gathered approximately 300 sediment samples from "areas of the river in which oils would be expected to accumulate downstream of Rockwell." Only seven of the samples contained high levels of Aroclor 1254. These samples, comprising less than 3% of the total number of samples removed from the River, were apparent anomalies that neither party could explain. Their presence does not discredit Barrick's opinion regarding the amount of PCBs released by Rockwell.

Based on all of the above, we conclude that the district court's factual determination that Rockwell likely released less than 20 pounds of PCBs into the Kalamazoo River is not clearly erroneous. We therefore need not address the KRSG's challenge to the other evidence that the district court cited as corroborating Barrick's opinion.

3. The district court did not err in determining that the factors concerning the relative toxicity of the PCBs released by the parties and the cooperation of the parties with the regulatory authorities did not favor any particular allocation of response costs

[11] The district court recognized that, in general,

the relative toxicity of the PCBs released by the parties and the parties' cooperation with the regulatory authorities are both relevant factors in allocating response costs. It determined, however, that neither factor offered any guidance as to the proper allocation of response costs in the present case. The KRSG challenges this determination, arguing that both factors favor allocating response costs to Rockwell.

First, the KRSG contends that the district court erroneously found that Rockwell and the KRSG members had released PCBs of approximately the same toxicity. The KRSG maintains that Aroclor 1254, the type of PCB that Rockwell released into the Kalamazoo River, is more toxic than Aroclor 1242. the type of PCB that its members released into the River. According to the KRSG, Aroclor 1254 bioaccumulates in fish at a much higher rate than Aroclor 1242, a fact that the KRSG insists is significant because the concerns about PCB levels in fish are allegedly "driving the response in this case." The KRSG further argues that, in terms of carcinogenic risk, the EPA considers Aroclor 1254 more toxic than Aroclor 1242.

But the district court had a reasonable basis for treating Aroclor 1254 and 1242 as equally toxic. In particular, the MDEQ issues fish advisories and other regulatory criteria without distinguishing between the different types of PCBs. The court noted that the MDEQ treats all PCBs the same because every type of PCB contains toxins. Although the evidence presented by the KRSG adequately supports a finding that Aroclor 1254 is more toxic than Aroclor 1242, we are not left with a "definite and firm conviction" that the district court erred in following the approach of the MDEQ. United States v. United States Gypsum Co., 333 U.S. 364, 395, 68 S.Ct. 525, 92 L.Ed. 746 (1948). Moreover, in light of the district court's finding with regard to the huge disparity in the relative quantities of PCBs released by the parties, a determination that Aroclor 1254 is somewhat more toxic than Aroclor 1242 would not likely have altered the court's allocation of response costs.

\*1052 The KRSG next argues that the district court's consideration of the cooperation factor was "deficient." Specifically, the KRSG points to evidence showing that Rockwell did not fully cooperate with the regulatory authorities. Rockwell, according to the KRSG, failed to provide important data to these authorities and "contrived stories" in an attempt to "explain away" its responsibility for releasing PCBs into the Kalamazoo River.

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The district court, however, in fact recognized that Rockwell had not fully cooperated with the regulatory authorities. But the court nevertheless determined that the cooperation factor did not weigh in favor of the KRSG because it found "a lack of full cooperation by both parties." (Emphasis added.) The KRSG offers no rebuttal to the district court's determination that, like Rockwell, it too did not fully cooperate with the regulatory authorities.

Accordingly, we conclude that the district court reasonably determined that both the toxicity and cooperation factors were not determinative in the allocation of response costs in the present case.

#### III. CONCLUSION

For all of the reasons set forth above, we **AFFIRM** the judgment of the district court.

NATHANIEL R. JONES, Circuit Judge, concurring.

While I concur in the judgment reached by Judge Gilman's well-reasoned opinion, I write separately to emphasize the remedial purpose of CERCLA. My colleague correctly concludes that the district court's factual findings did not obligate it to allocate response costs to Rockwell. However, it is important to address the CERCLA's central purpose because the outcome in this case presents a troubling anomaly.

Congress enacted CERCLA "to ensure prompt and efficient cleanup of hazardous waste sites and to place the costs of those cleanups on [potentially responsible parties("PRPs")]." United States v. Akzo Coatings of America, 949 F.2d 1409, 1417 (6th Cir. 1991). This court stressed the remedial purpose of CERCLA in its opinion which overturned the district court's "threshold of significance standard: "CERCLA's central purpose [is] facilitating the prompt cleanup of hazardous waste." Kalamazoo River Study Group v. Menasha Corp., 228 F.3d 648, 652 (6th Cir.2000); see also 126 Cong. Rec. 26,338 (1980) (stating that by enacting CERCLA, Congress intended to create "a strong incentive both for prevention of releases and voluntary cleanup of releases by responsible parties."). In Menasha, this court reasoned that CERCLA contribution plaintiffs should not "face the prospect of being required to establish that a particular defendant in fact contributed at least a minimally significant share of the wastes at issue," because it would deter contribution plaintiffs from cooperating with the government. <u>Menasha, 228 F.3d at 657.</u> This court, thus, held that the threshold of significance standard was contrary to CERCLA's remedial purpose because it "could discourage parties from voluntary cleanup efforts and from settlement." *Id.* 

In the specific context of response costs allocation in CERCLA contribution actions, federal courts have directly held that a district court's allocation of response costs will not be set aside unless it is determined that the court abused its discretion. *Meyer*, 932 F.2d at 573. Additionally, in these cases, the factual findings underlying the district court's allocation of response costs may be set aside only if clearly erroneous. *Schroyer*, 197 F.3d at 1173. My colleague correctly concludes that there was nothing erroneous about the district court's factual findings nor was there any abuse of discretion here. However, \*1053 I still believe the result in this case is both troubling and anomalous.

Despite Congress's intent to create "a strong incentive both for prevention of releases and voluntary cleanup of releases by responsible parties", Rockwell, a known polluter, has been allowed to escape response costs on the grounds that its PCB release was sufficiently "inconsequential" to remove the justification for allocation of costs. Thus, we are left with no "definite and firm conviction that a mistake has been committed" by a known polluter. *Logan*, 865 F.2d at 790 (6th Cir.1989).

Granted, Rockwell's PCB release was minimal. However, § 107(a) imposes strict liability for *any* release that causes a plaintiff to incur response costs. Although the equitable analysis provision of § 113(f) provides for judicial discretion with regard to the cost apportionment among PRPs, the statutory purpose of CERCLA and the principles of equity require that each PRP pay its fair share of response costs, no matter how large or small. Indeed, no PRP should pay more than their share, but neither should any party pay less. Here, however, Rockwell pays nothing.

Accordingly, by not allocating any response costs to a known polluter, the outcome in this case contravenes the important remedial purposes of CERCLA. Nevertheless, because I believe that the discretion regarding allocation of costs should remain with the district court, I join in this court's conclusion despite a rather pinched view of the statute, and CONCUR in the court's opinion.

274 F.3d 1043, 53 ERC 1705, 32 Envtl. L. Rep. 20,361, 2001 Fed.App. 0425P

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#### UNITED STATES DISTRICT COURT FOR THE WESTERN DISTRICT OF MICHIGAN SOUTHERN DIVISION

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SHALD WESTON, SR. CLERK
U.S. DISTRICT COURT
VESTERN DISTRICT MICH.

KALAMAZOO RIVER STUDY GROUP,

Plaintiff,

File No. 1:95-CV-838

HON. ROBERT HOLMES BELL

ROCKWELL INTERNATIONAL.

Defendant.
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#### MEMORANDUM OPINION AND ORDER

This action under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 ("CERCLA"), 42 U.S.C. § 9601, et seq., is currently before the Court on an expedited motion filed by Plaintiff Kalamazoo River Study Group ("KRSG") to reopen proceedings to reconsider the June 3, 2000, Order regarding allocation of costs against Defendant Rockwell/Meritor at the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site (the "Site"). Plaintiff has presented new evidence collected by the United States Environmental Protection Agency ("EPA"). These studies reflect significantly higher levels of PCBs on the Rockwell property than disclosed by the evidence presented at trial. These studies also reflect current releases of oils containing PCBs from the property into the Kalamazoo River.

Because this Court's June 3, 2000, Order is currently on appeal to the Sixth Circuit and this Court lacks jurisdiction to consider the motion, at this time KRSG merely requests the

Court to issue an order indicating that it is inclined to grant this motion to reopen proceedings according to the procedure approved in *First Nat'l Bank of Salem*, *Ohio v. Hirsch*, 535 F.2d 343, 345-56 (6th Cir. 1976).

Although Plaintiff does not cite the rule, this motion must be construed as a motion for relief from judgment pursuant to FED. R. CIV. P. 60(b)(2) on the basis of newly discovered evidence. Under the federal rules, such motions must be filed within a reasonable time, but no more than one year after the judgment was entered. FED. R. CIV. P. 60(b). "Where the ground for a litigant's motion for relief from judgment is newly discovered evidence or fraud (as it appears to be here), the motion must be brought within one year of the challenged judgment." Feathers v. Chevron U.S.A., Inc., 141 F.3d 264, 269 (6th Cir. 1998). Plaintiff's motion, filed sixteen months after the judgment was entered, is not timely.

Plaintiff suggests that Rule 60(b) is inapplicable to CERCLA actions because CERCLA is a remedial act and orders on allocation are subject to being revisited should the equities so warrant. The Court is not aware of any CERCLA exception to the Rule 60(b) time limit. In fact, the Sixth Circuit has clearly stated that the court has no authority to consider a motion brought outside the one-year time period. See McDowell v. Dynamics Corp. of Am., 931 F.2d 380, 383 (6th Cir. 1991) ("Appellee's motion was made more than one year after the judgment, and therefore could not have been granted under (1), (2) or (3)."); Smith v. Sec'y of Health and Human Servs., 776 F.2d 1330, 1332-33 (6th Cir. 1985) ("[T]he district court does not have the discretion to extend the period of limitation set forth

in Rule 60(b)."). The two cases Plaintiff cites in support of a delayed reopening of the record are inapposite. In Acushnet Co. v. Coaters, Inc., 972 F. Supp. 41 (D. Mass. 1997), the district court's judgment with respect to allocation was expressly made provisional, and allowed any interested party to initiate later proceedings to modify the provisional allocation based on evidence not yet accessible. Id. at 69. Similarly, in PMC. Inc. v. Sherwin-Williams Co., 151 F.3d 610 (7th Cir. 1998), the Seventh Circuit noted that the district court could enter a judgment on allocation before the remedial investigation and action were complete "subject to the court's revisiting the issue should a failure of cooperation or some other unforeseen circumstance make adherence to the original determination inequitable." Id. at 616. Unlike the cases cited, the order on allocation in this case was not a provisional order. Moreover, the cases cited do not support a CERCLA exception to the one year time limit contained in Rule 60(b).

Even if the delay is excused, Plaintiff has still failed to show that the evidence "by due diligence could not have been discovered in time to move for a new trial under Rule 59(b)."

FED. R. CIV. P. 60(b)(2). This case was filed in 1995. Plaintiff had the burden of proving Rockwell's release of PCBs to the Kalamazoo River. Plaintiff chose to rely on Rockwell's testing of its property under a separate EPA proceeding even though Plaintiff had reason to believe prior to the allocation phase of this case that Rockwell was not cooperating with the EPA's requests for additional PCB testing. Plaintiff has not shown that it would have been unable to secure the same evidence through its own testing of the property prior to the

allocation phase of this trial. Plaintiff never requested permission to enter onto Rockwell's property to conduct its own testing pursuant to FED. R. CIV. P. 34, or to delay the trial until such time as the EPA was satisfied with the testing. In an analogous case, the Fourth Circuit affirmed the district court's denial of a motion for new trial based on the EPA's post-trial reports of contamination because "all of these findings after that trial could have been discovered before the trial." Aliff v. Joy Mfg. Co., 914 F.2d 39, 44 (4th Cir. 1990).

This Court's decision not to reopen the record in this contribution action should not be interpreted as relieving Rockwell of any obligation it might have to assist in the clean up of the Kalamazoo River. Nothing in this decision affects the EPA's ability to subject Rockwell to liability for the release of hazardous wastes to the Kalamazoo River if the EPA finds that Rockwell is a potentially responsible party. Accordingly,

IT IS HEREBY ORDERED that Plaintiff's request for an order indicating that this Court is inclined to grant Plaintiff's motion to reopen proceedings to reconsider the CERCLA allocation against Rockwell/Meritor at the Kalamazoo River Site (Docket # 1018) is DENIED.

Date: Odobu 15 2001

ROBERT HOLMES BELL

CHIEF UNITED STATES DISTRICT JUDGE